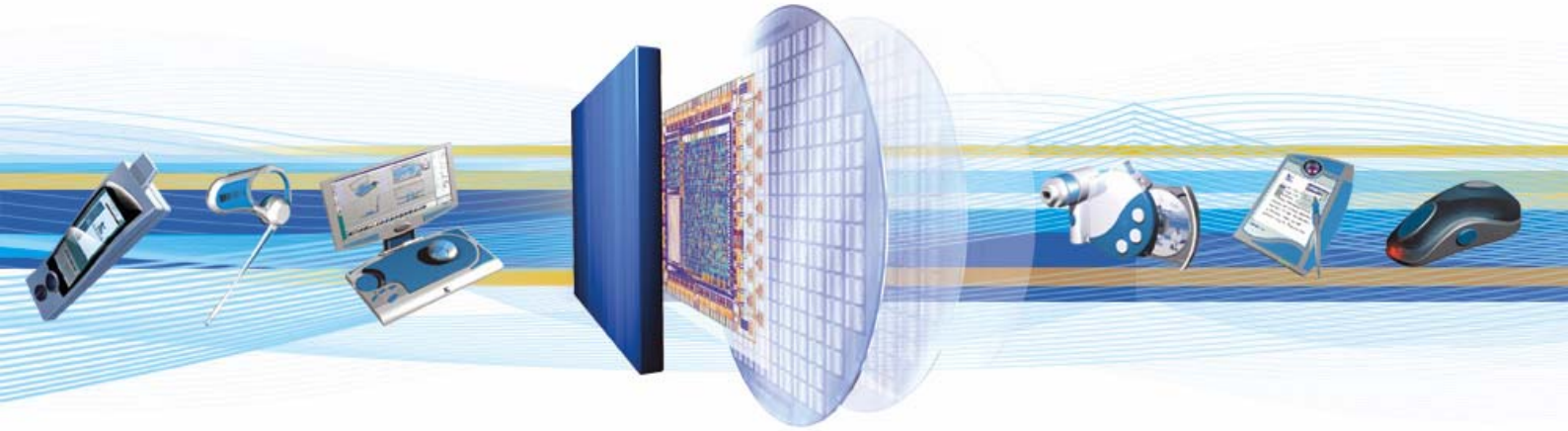
BlueLab™

# BlueLab v3.4

# Software Release Note

January 2006



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# 1 Introduction

This document describes **BlueLab™ v3.4**, the most recent release of BlueLab3, CSR's software development kit for producing embedded applications for CSR's Bluetooth® wireless technology chips. Some additional documentation is included with BlueLab; see the manual available inside xIDE, the integrated development environment for BlueLab and the accompanying PDFs.

## 1.1 BlueLab3

BlueLab3 has the same virtual machine (VM) architecture that has been successfully implemented in the vast majority of single-chip Bluetooth products, including around 70% of all headset designs. The VM isolates user code in a 'sandbox' where it cannot interfere with the basic Bluetooth operation of the chip. This allows the use of pre-qualified low-level stack firmware, greatly simplifying Bluetooth qualification process and reducing time to market. The user does not need to qualify complex low-level firmware. CSR does this.

BlueLab v3.0 introduced true on-chip, real-time debugging for the first time on any Bluetooth chip. There is no need to stop the chip running to get debug data. It is possible to watch traffic in real-time while the chip runs. The development environment monitors and records messages between the VM application and the upper layers of the Bluetooth stack. The resulting record can be as useful as, but much easier to obtain than, an air trace when debugging complex problems such as interoperability between two Bluetooth devices.

These features make BlueLab3 by far the most flexible and functional set of tools available for any Bluetooth chip today.

The new tools introduced with BlueLab3 make it easier to take advantage of its much improved and expanded set of software libraries. These libraries improve performance and consistency for functions such as event handling. Crucially, they are designed from the ground up to support applications that use multiple simultaneous connections. This function is essential for cutting edge Bluetooth products like wireless stereo headphones with call handling.

The library changes mean that applications written for BlueLab2 must be partially rewritten to run under BlueLab3. Rewriting the code need not be an arduous task because the new libraries automate many common functions. As a result BlueLab3 applications are considerably simpler than before. It is generally only necessary to write a user interface to sit above the highly functional libraries provided with the Software Development Kit (SDK).

The initial releases of BlueLab3 were focussed on wireless headphones with call handling (combined Headset/Hands-Free and Audiovisual profiles) because the ability to support multipoint connections is essential for these products.

## 1.2 BlueLab v3.4

BlueLab v3.4 includes the source code for CSR's best ever mono headset/handsfree application, designed for BlueCore3 and BlueCore4. It also includes the configuration tool for that headset, previously supplied as an update to the BlueLab v3.3 release. Source code for example HID keyboard, mouse and dongle applications are included for the first time in BlueLab v3.4.

It extends the set of profile libraries to include PBAP (Phone Book Access Profile) and DUN (Dial Up Networking), adding to the HID, AG, OBEX, SPP, AV and HFP libraries that where shipped with BlueLab v3.3.

BlueLab 3 now includes support for more profiles than BlueLab 2 and (with the exception of PAN applications) should be the preferred environment for new development of embedded applications on BlueCore.

BlueLab 3 fully supports the latest features of BlueCore4 and has been designed with support for future development of BlueCore chips.




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## 1.3 New Features in v3.4 Relative to v3.3

In addition to the changes noted in Appendix E , BlueLab v3.4 introduces the following new features:

- Application changes
  - Configuration tool and guide now included for the `headset` reference application
  - `hid_mouse`, `hid_keyboard` and `hid_dongle` reference applications included
- New firmware functionality
  - New type-safe functions introduced for configuring HID sensors
  - New `TransformPoll` function to detect data flowing through connected streams
  - New `TransformFromSource` and `TransformFromSink` functions
  - New message indicating USB suspend and resume operations
- Tool enhacements
  - Vmbuilder is more informative about available flash space and firmware incompatibilities
  - Flash reading support for kalimba now allows multiple flash data sections
- Additional firmware builds
  - Preliminary firmware is included for BlueCore4-Audio Flash
  - Compact firmware no longer supports HID, allowing larger headset applications on 6Mbit parts
  - Additional HID firmware is now included for 6Mbit parts
- Kalimba DSP library changes
  - A new `sco_process` library has been added, which eases the creation of applications that do processing of the SCO audio streams. It handles all of the buffer management to keep latencies to a minimum, and handling of the situations where the SCO link is disconnected but the connection to the DAC/ADC still exists.
  - The `cbops` library has been upgraded. The flexibility of connecting operators together has been increased, and a number of new operators have been added:
    - A `limited_copy` operator – used to limit the amount of data copied so that the resulting source or sink buffer only has a fixed amount of data in it (rather than copying the maximum possible)
    - A `mix` operator – used for mixing audio streams of the same sample rate together (e.g. tones and voice both at 8KHz)
    - A `sidetone_mix` operator – used to add in side-tone data to the out going speaker stream.
    - A `silence_clip_detect` operator – used to detect periods of silence in an audio stream (used for instance to decide whether to close the BT connection to save power). Also to detect clipping of the audio samples (used for instance to decide when to decrease the ADC gain).
    - A `copy` operator – used as a basic copy process between ports and buffers
    - A `one_to_two_chan` copy operator – used for copying samples from one input stream to two output streams (for example when creating a pseudo stereo output from a mono input).
    - A `status_check_gain` operator – used for copying data from an input port to a circular buffer. It fills the output buffer with silence if the input port is disconnected.




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- Flash reading support from Kalimba has been extended to support reading multiple segments each with a maximum size of 64Kword.

**Note:**

To make use of the flash access feature BlueCore3-Multimedia chips with a date code of 450 or later must be used.




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## 1.4 Requirements

This release of BlueLab runs on machines operating on Windows 2000 SP4 or later and Windows XP SP1 or later. The development tools access BlueCore through the Serial Peripheral Interface (SPI); therefore, a board supporting this (such as Casira™ or other CSR development boards) is also required.

SPI access is performed through low-level printer port access, therefore LPT1 must be available on the PC running BlueLab.




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# 2 CSR Chips

Applications produced with this development kit will run on CSR's **BlueCore™2**, **BlueCore3,** and **BlueCore4** chips, with a firmware build supporting Virtual Machine (VM) v7.4.

**Notes:**

The firmware builds supplied with this release all require 6Mbit or 8Mbit devices.

Full production firmware matching BlueLab 3.4 is expected to be available from the 22 branch during 2006.

BlueLab 3.4 applications can also be used with 21c and later production firmware, provided the application and libraries do not make use of the new firmware functionality listed in section 1.3.




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# 3 Release Functionality

## 3.1 xIDE

This release of BlueLab includes CSR's integrated development environment, xIDE, supporting development and debugging of both VM applications (in C) and Kalimba DSP code (in assembler).

## 3.2 Toolchain

BlueLab includes a set of development tools for VM applications:

- Compiler based on GCC v3.3.3 and targeting the BlueCore VM
- Supporting assembler, librarian and linker
- Libraries providing access to BlueCore specific features
- Libraries providing implementations of selected standard ANSI functions

BlueLab also includes development tools for Kalimba DSP applications written in assembler:

- Assembler, with linking ability
- Tools for embedding Kalimba DSP applications and data in BlueCore's read-only file system
- Libraries providing commonly required services
- Matlab tools to aid debugging of Kalimba DSP applications and libraries

Additional tools (from BlueSuite™) are provided for downloading applications and updating the Persistent Store.

## 3.3 Support Libraries

In addition to the standard libraries, BlueLab includes libraries specific to BlueCore and Bluetooth:

- Battery library sampling voltage level
- Message library for splitting applications into communicating tasks
- Panic library for detecting errors and terminating the application
- Service and region libraries for searching SDP records
- MD5 library to support authentication in PBAP (Phonebook Access Profile)

## 3.4 Application Libraries

The following libraries build on BlueStack to simplify the production of Bluetooth applications:

- Connection library
  - Can create RFCOMM, L2CAP and SCO connections
  - Manages security settings and link policy
- AV profile libraries supporting applications using the Bluetooth AV profiles
- HFP library supporting applications using the headset and hands-free profiles
- SPP library supporting applications using both roles of the serial port profile
- GOEP library supporting the client and server role of the generic object exchange profile underlying OBEX
- FTPC and FTPS libraries implementing the client and server side of the file transfer profile using GOEP
- OPPC and OPPS libraries implementing the client and server side of the object push profile
- AGHFP library supporting the audio gateway profile




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- HID library supporting the human interface device profile
- DUN library supporting the dial up networking profile
- PBAP library supporting the phonebook access profile

## 3.5 Kalimba DSP Libraries

- Core library – basic low-level routines:
  - Timers
  - Messages (now includes long message support)
  - Interrupts
  - Connection buffers
  - cbuffer operators (`cbops`) library – handles copying of data from a source buffer to a destination buffer with optional processing of the data in a simple *linked list of operators* type. way.
  - Profiling
  - Flash access (functions to aid reading of flash memory from the DSP).
- Audio compression CODEC libraries
  - sbc library –mandatory CODEC SBC (Sub-band Coding), both encoder and decoder, for the Bluetooth AV profiles.
  - mp3 library – an mp3 decoder supporting the lower sample rate extensions of MPEG2/2.5.
- codec library – handles streaming audio over Bluetooth using the selected audio compression CODEC (sbc, mp3 etc)
- Math library – optimised `fft`, `ifft`, `sin`, and `sqrt` functions.
- sco_process library – eases the creation of applications that handle the processing of SCO audio streams

## 3.6 Example Applications

The following example applications are supplied.

**Note:**

These are for demonstration purposes only and are intended as the starting point for customers' development effort.

**On multimedia variants of BlueCore**

- `stereo_headset` application implementing both a stereo headset and a stereo AV sink, including an evaluation implementation of cVc (Clear Voice Capture) echo cancellation and noise reduction software.
- `a2dp_source_dongle` implements an AV source, taking audio from one of:
  - internal stereo CODECs
  - an external Wolfson CODEC
  - USB, enumerating as USB speakers

**Targeting BlueCore3-Audio Flash**

- `headset` application implementing a mono headset.

**Note:**

It is also possible to use this application on older BlueCore variants, but modifications will be required.




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**Targeting BlueCore variants running HID or unified versions of Firmware**

- `hid_mouse`
- `hid_keyboard`
- `hid_dongle`

**On all variants of BlueCore:**

- `spp_dev_a` and `spp_dev_b` implementing role A, or role B, of the serial port profile
- `ftp_server`
- `obex_server`
- `opp_server`

Example applications are also provided demonstrating:

- routing of SCO data through the Kalimba DSP (`sco_dsp` and `sco_master` applications)
- use of the SBC encoder and decoder libraries (`test_sbcloopback` application)
- use of the mp3 decoder library (`test_mp3decoder` application)
- sending long messages between the Kalimba DSP and VM (`kalimba_long_message_example` application)
- accessing flash memory from the Kalimba DSP (`kalimba_flash_access_example` application)
- generating of test tones (`test_tonegen` application)
- use of the FTPC, GOEP and OPPC libraries (`ftpc`, `goep`, and `oppc` applications)




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# 4 Firmware

CSR's policy is to distribute, with BlueLab, a selection of firmware builds whose sole purpose is the development of applications. Before going into production the developer must obtain from CSR Bluetooth-qualified production firmware (which they can use in place of the development firmware supplied with BlueLab). This is a mandatory part of the qualification process.

This release of BlueLab v3.4 includes development firmware for use with BlueCore2-External, BlueCore2-Audio, BlueCore2-Flash, BlueCore3-Audio Flash, BlueCore3-Multimedia, and BlueCore4-External.

| Firmware name | Hardware | Flash Size | Read only Filesystem | HID | RFCOMM | DFU | Application size limits | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Code | Const | Total |
| unified_bc02 | BC2-external | 8Mbit | Yes | Yes | Yes | Yes | 64Kw | 24Kw | 88Kw |
| unified_kato | BC2-audio/flash | 8Mbit | Yes | Yes | Yes | Yes | 64Kw | 24Kw | 88Kw |
| unified_kalimba | BC3-multimedia | 8Mbit | Yes | Yes | Yes | Yes | 64Kw | 24Kw | 88Kw |
| enhanced_kalimba[(1)] | BC3-multimedia | 8Mbit | Yes | Yes | Yes | Yes | 64Kw | 24Kw | 88Kw |
| unified_coyote | BC4-external | 8Mbit | Yes | Yes | Yes | Yes | 64Kw | 24Kw | 88Kw |
| compact_paddywack | BC3-audio flash | 6Mbit | Yes | No | Yes | No | 64Kw | 24Kw | 52Kw (approx) |
| hid_paddywack | BC3-audio flash | 6Mbit | Yes | Yes | No | No | 64Kw | 24Kw | 68Kw (approx) |
| compact_jumpinjack | BC4-audio flash | 6Mbit | Yes | No | Yes | No | 64Kw | 24Kw | 48Kw (approx) |
| hid_jumpinjack | BC4-audio flash | 6Mbit | Yes | Yes | No | No | 64Kw | 24Kw | 60Kw (approx) |

[(1)] This enhanced firmware has partial support for EDR but cannot be qualified to the v2.0 + EDR Bluetooth Specification.

**Notes:**

Limits on the application size when the read-only filesystem is available assume that no other data is being placed there. Adding other files to the filesystem may reduce the figure for the total application size.

The hardware type is detected automatically by xIDE.

Choosing between compact, unified, hid and enhanced firmware is done using the project properties within xIDE.

**Important Note:**

The firmware builds supplied with this release all require 6Mbit or 8Mbit devices.

Full production firmware matching BlueLab 3.4 is expected to be available from the 22 branch during 2006.

BlueLab 3.4 applications can also be used with 21c and later production firmware, provided the application and libraries do not make use of the new firmware functionality listed in section 1.3.




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# 5 Major Changes in BlueLab3 Relative to BlueLab2

BlueLab3 builds on many years of experience with BlueLab1 and BlueLab2. Many components have been redesigned and replaced to make it easier and faster to build the sort of applications CSR's customers are now working on.

## 5.1 Tool Changes

The most visible change in BlueLab3 is the addition of xIDE, a complete integrated development environment. xIDE allows projects to be created, code to be edited, VM applications to be compiled, and Kalimba DSP code to be assembled within a single environment.

xIDE replaces the Java-based appdebug from BlueLab2. It also replaces the Matlab-based kaldbg which was provided as part of BlueLab v2.85 and later. The requirement to install Cygwin and Java has also been eliminated.

xIDE supports on-chip debug of applications over BlueCore's SPI debug interface, making it possible to debug applications which take control of the USB or UART interface on BlueCore. Such applications include serial-cable replacement and USB dongles.

The Matlab-based kalasm from BlueLab2.85 and later has also been replaced by a new version, kalasm2.

A new C compiler based on gcc3.3.3 has replaced the gcc 2.95 compiler used in BlueLab2 and typically yields a 10% improvement in code density.

## 5.2 Library Changes

The most significant change in BlueLab3 is the introduction of the new connection library which supports any combination of RFCOMM, L2CAP and SCO connections (and, soon, TCP and UDP) serving multiple profiles. For example, a single application implementing both AV and HF profiles is now possible. (The single connection and single profile limitations imposed by the `cm_rfcomm` library in BlueLab2 no longer apply.)

The lower level libraries have been completely rewritten to support the new connection library. Notification of asynchronous events, either from the firmware or from lower-level libraries, is now uniformly handled by the delivery of messages. Tasks are now dynamically created and combine message handlers with local state. The scheduler library in BlueLab2 has been replaced by a simplified message loop, cutting latency on message delivery by a factor of five.

The upper level libraries, which correspond to Bluetooth profiles, have also been completely rewritten as tasks which use the new connection library. This makes it possible to combine multiple profiles in a single application. For example an application can now open multiple SPP connections simply by creating multiple instances of the SPP profile.

## 5.3 Application Changes

BlueLab2 and BlueLab3 applications look significantly different. In general a BlueLab3 application is much simpler than the corresponding BlueLab2 application, especially when multiple connections or profiles are being used. A typical BlueLab3 application simply arbitrates between the user-interface logic and the profile instances it creates.

However, the extensive changes to the libraries make it impractical for the same code to work with both BlueLab2 and BlueLab3. An existing BlueLab2 application will have to be partly rewritten to work with BlueLab3.




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# 6 Testing

BlueLab v3.4 has been in use within CSR throughout its development. Furthermore, explicit testing has covered:

- Installation (and de-installation) on all supported platforms
- Component testing of the `connection` library and profile libraries

A list of known issues is in Appendix A on page 15. CSR welcomes reports of any additional issues through official support channels.




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# 7 Document References

| Document: | Reference, Date: |
|---|---|
| Specification of the Bluetooth System | Core Specification v2.0 + EDR 4 November 2004 |
| Headset Profile | Headset Profile Part K:6, v1.1, 22 February 2001 |
| Hands-free Profile | Hands-free Profile, v1.0, 29 April 2003 |




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# Appendix A Known Issues

This section lists currently known issues for BlueLab v3.4. The Severity column gives a subjective assessment (Cosmetic, Minor, Major) of how severely each issue may affect the use of BlueLab v3.4.

The following items are known problems with the functionality of components which are new to BlueLab3.

| ID | Severity | Description |
|---|---|---|
| B-2844 | Minor | It is not currently possible to build a BlueLab library from within xIDE; this must be done using the shortcut placed in the Start Menu, or Makefiles from the command line. |
| B-3575 | Minor | `DacGetBlock/Level` and `AdcSetBlock/Level` are missing from BlueLab3. |
| B-3740 | Minor | If an error occurs while building the BlueLab libraries from the start menu, the window is closed losing the error messages. (Invoking the same command from the command-line is an effective workaround.) |
| B-4221 | Minor | BlueLab3 is missing library routines necessary to handle long long types. |
| B-4222 | Minor | gcc3 -O2 and -O3 optimisation levels are known to generate incorrect code. |
| B-4264 | Cosmetic | Installing exactly the same version of BlueLab twice, then attempting to uninstall can leave orphaned shortcuts on the system. |
| B-4314 | Minor | The `a2dp_source_dongle` application can sometimes take longer than the mandated 100ms to respond to an AVRCP transaction when streaming audio. |
| B-4315 | Major | The `a2dp` library only supports one active stream endpoint. |
| B-4408 | Minor | The `connection` library does not currently handle TCP or UDP connections. |
| B-4924 | Major | The supplied firmware does not support SPDIF on BlueCore3 Multimedia. |
| B-5017 | Minor | The L2CAP handler does not currently handle configuration messages which use the `more_data` flag; this is minor since all L2CAP configurations fit into a single MTU. |
| B-5174 | Minor | If variables are initialised with values which have to be calculated by the preprocessor, certain combinations using divide cause kalasm2 to return an error. |
| B-5235 | Minor | Only a single instance of the `a2dp` library can be created by the application. Attempts to create more than one instance will fail. |
| B-5241 | Minor | Only a single instance of the `avrcp` library can be created by the application. Attempts to create more than one instance will fail. |
| B-5504 | Minor | BlueFlash offers to erase VM applications, but erases the 32Kw legacy sector rather than the filesystem which is where BlueLab3 applications are stored. |
| B-5608 | Major | Stream connections using a file as their source are terminated when the source file is empty not when the last of the data has been read from the connection. This makes it impossible for the Kalimba DSP to read the last few hundred bytes of data from a file. |
| B-5662 | Minor | It's not possible to run two instances of gcc at once due to poor naming of temporary files. Avoiding parallel `make` instances (such as building from two instances of xIDE at the same time) will avoid triggering this bug. |
| B-6228 | Minor | Security in the connection library is currently configured globally or by service. Per device settings are not yet supported. |
| B-6841 | Minor | If the UART is being used for user data then BlueCore does not restart the timer for `PSKEY_UART_SLEEP_TIMEOUT` when it receives data on the UART while awake. It uses activity to wake up from deep sleep, but it does not register any activity while the chip is awake.<br>Since BlueCore should be told by the VM when it's safe to enter deep sleep, this is unlikely to affect VM applications, but users should be aware of this behaviour. CSR may provide the facility for the user transport to behave as the BCSP one does in this regard at a later date. |
| B-7051 | Minor | In certain functions, the debug information output by gcc is incomplete, leading to function arguments sometimes not being available in the variables widget in xIDE until some way through the function. |




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| ID | Severity | Description |
|---|---|---|
| B-7645 | Major | The a2dp_source_dongle application does not enter DFU mode. |
| B-7903 | Minor | When using BCSP as the transport for PSTool and selecting a COM port which does not exist (or is already in use), PSTool causes an internal error in the C++ runtime library. |
| B-8026 | Minor | It is not currently possible to add custom capabilities to a stream endpoint using the function A2dpAddSep(). This is because the custom capabilities message contains a pointer to the capabilities held in memory on the stack. |
| B-8354 | Minor | The a2dp library is coupled to the multimedia versions of BlueCore; it currently assumes that it should check for DSP codecs in the filesystem and load them onto the DSP as required. |
| B-8564 | Minor | xIDE strips path components from source files when generating makefiles, which means that all project files must be in the same directory. |
| B-8714 | Minor | Sometimes bitfield values can be displayed incorrectly in xIDE. |
| B-8861 | Minor | xIDE should provide a way of merging the application and firmware without requiring the appropriate hardware to be connected over SPI and then flashing it. |
| B-8888 | Minor | If extra indicator reporting is enabled in the hfp library, the initial values of the extra indicators are not sent to the client. |
| B-8979 | Minor | Occasionally an AVRCP connection attempt from one device to another will fail when running multiple iterations of connects then disconnects. This is classed as minor as the fail rate is very low. |
| B-8997 | Minor | The AG library currently only considers LMP support when opening eSCO; this can result in a failed attempt to open an eSCO connection to a device which explicitly supports HFP1.0 (rather than HFP 1.5). |
| B-9727 | Major | DFUWizard is not included with this release of BlueLab. |
| B-9877 | Minor | If the VM project is not before any Kalimba projects in a workspace, the Kalimba debugger may not operate. |
| B-10032 | Minor | kalasm2 does not currently support the Borrow and Not Borrow flags. This can be worked around by using the Not Carry and Carry flags respectively. |
| B-10894 | Minor | The connection library does not directly support DM_HCI_READ_REMOTE_VERSION_COMPLETE. |
| B-11093 | Minor | The message CL_SM_ENCRYPTION_CHANGE_IND is unhandled which causes a Panic in the debug build of the gavdp library. |
| B-11148 | Major | Call Manager and Audio Handler now cooperate with one another. This makes it impossible to open/close an audio connection while a call is being setup/shutdown (or vice-versa). |
| B-11224 | Minor | If a device keeps connecting and disconnecting very quickly to a device running the HFP/HSP profile, then the service record can become unregistered when the devices are not connected. |
| B-11271 | Minor | The Kalimba in BlueCore3 does not allow the last instruction in a DoLoop to be a function call, as this is only supported in BlueCore5. However, no warning is given when the target device is BlueCore3. |
| B-11616 | Minor | The experimental StreamEnableSniffSubrating call present in BlueLab v3.3 is not supported in the firmware supplied with BlueLab v3.4. Applications calling this trap will not run with the supplied firmware.<br>This will be reviewed once sniff-subrating has been standardised and suitable firmware is produced. |
| B-11662 | Minor | The BlueStack tab in xIDE does not correctly display the contents of DM_HCI_WRITE_CURRENT_IAC primitive, showing zeroes in the iac_lap field. |
| SEP-16 | Minor | The remote control functionality of the a2dp_source_dongle does not work with MacOS X. This is because MacOS does not natively support the required HID events. It is possible, however, to write a MacOS driver to implement this functionality. |

**Table Appendix A.1: Known Issues**




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The following items are known problems with xIDE.

| ID | Severity | Description |
|---|---|---|
| M-391 | Cosmetic | After an application panic, it's still possible to click step and run in xIDE but they return error messages. |
| M-406 | Minor | Stepping over `MessageLoop` will cause xIDE to stop responding until a message is received. |
| M-452 | Minor | xIDE has excessive PC CPU usage while polling a running VM application. |
| M-455 | Minor | xIDE takes a long time to load debug information for large VM projects. |
| M-467 | Minor | Stopping xIDE while firmware is being downloaded leaves a stray `BlueFlashCmd.exe` process running. |
| M-469 | Major | Stepping over functions in Kalimba DSP code in xIDE incorrectly steps into the function. |
| M-475 | Minor | xIDE tracks breakpoints by source line, which means inserting lines in front of the breakpoint can cause it to move without warning. |
| M-563 | Minor | If auto-indent is enabled then xIDE can incorrectly indent lines when `Undo` is used. |
| M-582 | Cosmetic | xIDE sometimes starts with a window partially off the screen; a workaround is to right-click on xIDE in the task bar and select **Move**, bringing the window back on screen using the cursor keys. |
| M-607 | Minor | If local and global variables have the same name, then xIDE will only display one of them while debugging a VM application. |
| M-678 | Minor | Pointers to opaque types (such as GAVDP) in a VM application sometimes fail to display correctly in xIDE, even when the type has later been fully defined elsewhere in the source file. |
| M-704 | Minor | The **Stop-Build** button produces strange results if pressed during start-up of a Kalimba project. |
| M-744 | Minor | It is possible for xIDE to open two different buffers onto the same file causing confusion when changes are made in one of the buffers. (Provoking this requires typing in path names rather than selecting them from the lists in the file dialogs.) |
| M-745 | Minor | Using **F4** in xIDE to go to the next error does not restart from the top of the list of errors after rebuilding the application. |
| M-754 | Minor | Single stepping through single instruction do loops performs three instructions on each step. |
| M-761 | Minor | The Kalimba register window groups the registers by type, these groups can be expanded and collapsed by the user, however, after each run xIDE resets the window and collapses each group. |
| M-769 | Minor | If xIDE is closed while it's switching to debug mode, it crashes with a memory error. |
| M772 | Minor | Batch build builds the active configuration several times, rather than building all the different configurations. |
| M-780 | Minor | xIDE will fail with a memory exception if operations are performed on a project in a workspace after the project has been removed (e.g. deleted). |
| M-815 | Minor | Pressing **F4** in xIDE to go to the next error can be confused by errors which actually occur in included files. |
| M-821 | Minor | Removing all projects from a workspace crashes xIDE. |
| M-829 | Minor | When debugging a multi-project workspace in xIDE, the project selector in the debug toolbar can activate the wrong project or show the wrong project as being active.<br>Selecting and viewing the active project using the navigator pane is an effective workaround. |
| M-837 | Major | If vm memory or register widgets are opened after a panic, they display all zeros. To work around this problem, click **show next statement** on the debug menu after opening the widgets. |
| M-842 | Minor | Search and replace can take several minutes to complete for a few thousand replacements. |




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| ID | Severity | Description |
|---|---|---|
| M-871 | Minor | xIDE can crash with a memory access if you choose to **restart all processors** in a combined DSP and VM project. |
| M-872 | Minor | Running or stepping from a kalimba break instruction at the end of `do..loop` block may not work as expected. |
| M-873 | Minor | Writing a kalimba register does not affect the value of the register where it is used as a data or program address in the current instruction. |
| M-874 | Minor | Stepping over kalimba instructions like `if [condition] call [address]` fails to stop on the following instruction if the condition is not satisfied. |

**Table Appendix A.2: Known Issues (xIDE)**

The following items correspond to features which were present in BlueLab2 but are not available in BlueLab v3.4.

| ID | Severity | Description |
|---|---|---|
| B-3575 | Minor | `DacGetBlock/Level` and `AdcSetBlock/Level` are missing from BlueLab3. |

**Table Appendix A.3: Missing Features**




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# Appendix B Issues Resolved in BlueLab v3.1

The following issues were fixed in the BlueLab v3.1 release.

| ID | Severity | Description |
|---|---|---|
| B-1730 | Minor | The `strcmp` and `memcmp` functions in the C library now correctly use unsigned char according to the C standard, rather than plain char. |
| B-3997 | Minor | `ConnectionReadRemoteName` has been implemented in the connection library. (It truncates names longer than 31 characters.) |
| B-4158 | Minor | The (unused) `a2dp_discover` call has been removed from the `a2dp` library. |
| B-4335 | Major | The `hfp` profile library will silently ignore any AT+VGS commands which come in faster than they can be handled. This is to avoid memory exhaustion. |
| B-4379 | Minor | Server side functionality has been added to the `GOEP` library. |
| B-4404 | Minor | The `av_headset` and `av_headset_hfp` applications now attempt to close down the AV connection gracefully when powered down. |
| B-4658 | Minor | The `avrcp` library now provides a power table to the `connection` library. It uses the priority passed to `AvrcpInit` by the application. |
| B-4677 | Major | An issue in the `av_headset_hfp` application where audio playback would not resume after the Source initiated an AVDTP_SUSPEND followed by AVDTP_START has been resolved. |
| B-4760 | Minor | `kalimba_standard_messages.h` header has been added listing various messages passed between the Kalimba DSP code and the supplied VM applications. |
| B-4769 | Fatal | Messaging from the Kalimba DSP to the VM application does not work with the firmware shipped with BlueLab 3.0-release. This has been resolved in subsequent firmware builds. |
| B-4771 | Fatal | gcc3 has been updated to prevent it from generating incorrect assembler code for shifts in certain code fragments. |
| B-4811 | Fatal | kalasm2 no longer writes truncated `.klib` files on certain source files. |
| B-4813 | Cosmetic | xIDE no longer displays the (unused) BH and BL registers which were needed for gcc2. |
| B-4841 | Minor | The `goep` and `ftpc` libraries have been extended to enable use of the optional type header. |
| B-4848 | Major | Selection and loading of the Kalimba CODEC has been moved into the `a2dp` library (previously it was performed by the client applications.) |
| B-4849 | Major | The `a2dp` library now performs capability negotiation for the CODECs and notifies the application of the result. |
| B-4895 | Minor | The `a2dp` and `gavdp` libraries now refers internally to the AV stream using sinks rather than the SEID. The SEID is still passed up to the application for informational purposes. |
| B-4916 | Major | The `a2dp` library now handles SEP registration. The application only needs to specify the type(s) (SBC,MP3, ...) of SEP they wish to register. |
| B-4918 | Minor | The `a2dp_source_dongle` application can now be built so that it accepts an analogue input using the new `codec` library, or enumerates as USB speakers. |
| B-4973 | Minor | A generic `codec` library for BleCore3 Multimedia has been added which currently supports both the internal CODECs and an external Wolfson WM8731. |
| B-5005 | Minor | The `connection` library now informs clients that an ACL connection has been opened by sending `CL_DM_ACL_OPENED_IND`. |
| B-5008 | Minor | The debug variant of the `connection` library now checks the status field of primitives it would otherwise ignore and panics if the status field is bad. |
| B-5010 | Minor | Support for changing the local name has been added to the `connection` library. |




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| ID | Severity | Description |
|---|---|---|
| B-5039 | Minor | The GOEP library now sends an explicit delete request to its application when a remote client wishes to delete an object. |
| B-5059 | Major | The hfp library now unconditionally sends volume indications to the client when in headset mode. Previously it incorrectly checked the local supported features but those are relevant only to the hands-free profile. |
| B-5069 | Minor | Firmware for BlueCore4-external is now included with BlueLab. |
| B-5084 | Major | A possible infinite loop in gavdpHandleTransportChannelClosed in the gavdp library has been eliminated. |
| B-5098 | Minor | The gavdp library no longer relies on a (30 second) timeout to detect failed connections. |
| B-5111 | Minor | A FileParent function has been added to find the directory containing an item in the read-only file system. |
| B-5120 | Minor | The buttonparse tool has been extended to allow the creation of messages for double key presses. |
| B-5131 | Minor | The gavdp library now returns an error message to the client if GavdpClose is attempted while in the wrong state. The close operation itself is not attempted. |
| B-5138 | Major | The hfp library now correctly frees the memory containing the results of an SDP search. |
| B-5171 | Major | The spp and goep libraries now correctly free the memory containing the results of an SDP search. |
| B-5181 | Minor | The TGAVDP100 timeout in the gavdp library has been increased to avoid signalling timeouts in cases where the packets are delayed due to heavy Bluetooth usage such as a scatternet with both a SCO connection and AV streaming. |
| B-5188 | Minor | The test_headset application now correctly sets up PSKEY_FIXED_PIN. |
| B-5192 | Minor | The PcmRate and PcmRoute calls are deprecated; the supplied example applications now use the combined PcmRateAndRoute call. |
| B-5193 | Minor | The test_headset application now tries to use the internal CODEC and, if that doesn't exist, an external CODEC. As a result it will work on BlueCore variants with internal and external CODECs. |
| B-5194 | Minor | Both av_headset and av_headset_hfp now panic if an attempt to register an SEP fails during startup. Previously they would just fail mysteriously if, say, the required Kalimba DSP application was not present on-chip. |
| B-5253 | Fatal | gcc3 has been updated to eliminate a possible fatal failure during the reload phase of a 'movhi' instruction. |
| B-5297 | Major | The linker 'ld' has been updated to eliminate warnings and a possibly incorrect stackusage calculation for programs containing very large call instructions. |
| B-5409 | Minor | New StreamConnectAndDispose function added. |
| M-387 | Major | xIDE should now correctly display the source code for kalimba libraries. |
| M-530 | Minor | PSKEY_VM_DISABLE can no longer be accidentally left set to 2 (debug) if xIDE terminates abnormally; the VM will be left in the state it was before debugging. |

**Table Appendix B.1: Issues Resolved in BlueLab v3.1**




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# Appendix C Issues Resolved in BlueLab v3.2

The following issues were fixed in the BlueLab v3.2 release.

| ID | Severity | Description |
|---|---|---|
| B-998 | Minor | If a peer device opens and then closes a SCO connection before the application has a chance to respond with DM_SCO_CONNECT_RES, a DM_SCO_DISCONNECT_IND is now sent (previously no primitive was sent to indicate the disconnection.) |
| B-3579 | Minor | The MessageStatusTask and StatusQuery calls have been introduced; these allow querying of link status which was performed using the event library in BlueLab2. The examples/test_status application illustrates their use. |
| B-3839 | Minor | The connection library no longer rejects multiple rounds of RFCOMM parameter negotiation. |
| B-4026 | Cosmetic | The security related function calls in the connection library now take a uint32 as the channel parameter (previously they took a uint16 which was passed to BlueStack as a uint32.) |
| B-4175 | Cosmetic | The code generated by genparse has been adjusted to lint cleanly, but no functional changes were involved. |
| B-4390 | Minor | The examples/test_headset application supplied with BlueLab3.0 and 3.1 was incomplete and has been removed from BlueLab3.2. It will be replaced with a full application in a later release. |
| B-4412 | Minor | In the a2dp library a number of debug panics have been removed. If this error condition occurs the a2dp library now sends an error message instead. |
| B-4572 | Major | gcc no longer generates invalid calling patterns for obscure cases involving 32-bit division where the result is passed to functions with many arguments. |
| B-4639 | Minor | xIDE now correctly handles the case where both a .button file and the .c file it generates are part of a project. Previously it would cause an error from the linker. |
| B-4699 | Fatal | SPI transports, no longer fail on fast ( > 2.1 GHz ) machines. The problem was caused by a signed integer being used for storing the clock speed. |
| B-4925 | Minor | The AV_Control debug application for the PC no longer displays the SBC format and bitpool. This is a result of changes made to CODEC negotiation in the on-chip application. |
| B-5007 | Minor | On receiving a DM_SM_ENCRYPTION_CHANGE message from BlueStack the connection library now sends a CL_SM_ENCRYPTION_CHANGE_IND message to each task that owns a connection on that ACL. |
| B-5011 | Minor | The ConnectionSmEncrypt function has been added to the connection library. |
| B-5012 | Minor | The CL_SM_REMOVE_DEVICE_CFM message has been removed from the connection library interface as it was never sent. |
| B-5038 | Fatal | kalasm2 should no longer report ERROR linking ????.klib "already in Module $mymodule". |
| B-5086 | Minor | The documentation for the ConnectionSmSetSdpSecurityIn() function has been updated to make its usage clearer, and its use in the supplied code has been made more consistent. |
| B-5133 | Minor | Within BlueLab applications, MORE_DATA messages used to be generated for every piece of data which arrived. The firmware has been updated to combine such messages automatically when they would be adjacent. This can vastly reduce the number of such messages seen by the application, and reduces the likelihood that a flood of messages can crash the firmware. |
| B-5167 | Minor | The a2dp_source_dongle application no longer initialises a superfluous instance of the codec library when USB_AUDIO_MODE is defined. |
| B-5230 | Fatal | kalasm2 now works reliably on Windows XP SP2; problems included errors being reported incorrectly and also incorrect assembler output. |




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| ID | Severity | Description |
|---|---|---|
| B-5236 | Minor | The BlueLab toolchain has been extended to support large read-only filesystems on custom hardware using 16-Mbit of flash. |
| B-5248 | Minor | gcc no longer outputs redundant nop instructions. |
| B-5249 | Minor | The `hfp` library now sends a `HFP_ENCRYPTION_CHANGE_IND` message to the application task in response to receiving a `CL_SM_ENCRYPTION_CHANGE_IND` message from the `connection` library. |
| B-5250 | Minor | In HFP mode, if a remote device disables encryption and does not re-enable it within 5 seconds, the `av_headset_hfp` application will now disconnect the Service Level Connection to that device. |
| B-5277 | Minor | The `a2dp` library now allows switching between SBC rates by passing in configuration values, rather than requiring the `profile` library to be rebuilt. |
| B-5325 | Minor | The `gavdp` library Reconfigure error codes have been reworked to be compliant to AVDTP test TP/SIG/SMG/BI-14-C |
| B-5332 | Minor | The `connection` library has been updated to use the newly added power states interface to BlueStack. The `connection` library no longer needs to manage switching between the different low power modes as this is done automatically by BlueStack based on a power table supplied to it. |
| B-5339 | Minor | A `vGen` library has been added to help OBEX applications generation vCard-like values. |
| B-5380 | Major | The `connection` library now correctly handles crossover between incoming and outgoing L2CAP connections. |
| B-5390 | Minor | Fixed a memory leak in `av_headset_hfp`, `av_headset`, and `a2dp_source_dongle` when AVRCP requests are received in unexpected states. |
| B-5397 | Minor | The `avrcp` library now rejects L2CAP connection requests if it is currently not in the correct state to accept an incoming connection. |
| B-5414 | Minor | Adding and removing files from the image/ directory now forces the read-only filesystem to be rebuilt (previously it was only rebuilt if a file was added with a date-stamp later than the last time the filesystem was built.) |
| B-5425 | Minor | When removing a device from the list of paired devices the `connection` library did not remove it from the security manager in BlueStack. This would allow a device that had been removed from the list of paired devices to still connect, until a reset had been performed. |
| B-5426 | Minor | A debug panic has been removed from the `connection` library; it could be triggered when it received an `RFC_ESTABLISH_CFM` message for a connection that had already been disconnected. |
| B-5427 | Cosmetic | The `battery` library function `BattInit` has been renamed to `BatteryInit`. |
| B-5438 | Major | The `A2dpConfigure()`function has been removed because it had no effect and if exposed required qualification. |
| B-5440 | Minor | The `l2cap_mtu` parameter has been removed from the `GavdpInit` function as it was not being used. |
| B-5458 | Major | In the `spp` library, the `SPP_CONNECT_CFM` message now correctly contains the SPP profile instance pointer. |
| B-5465 | Minor | The `av_headset_hfp` headset application cancels the `BUTTON_PLAY_PAUSE_REL` message on a failure to create an SLC connection so it no longer continually attempts to connect the SLC if the first attempt failed. |
| B-5475 | Minor | The `connection` library now sends a `CL_DM_ACL_CLOSED_IND` message whenever an ACL is closed. The message is sent to the task registered with the `connection` library as the main client task. |
| B-5476 | Minor | The `hfp` library now correctly handles rejecting a call while another call is active. |
| B-5480 | Minor | The `gavdp` library now rejects malformed `set_configuration` requests where more than one bit is set in any particular configuration field. |




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| ID | Severity | Description |
|---|---|---|
| B-5485 | Medium | MPEG-2/4 AAC support added in a2dp library |
| B-5492 | Minor | The goep library no longer calls ConnectionSmSetSdpSecurityOut to disable SDP security; it now leaves this policy decision to the application. |
| B-5496 | Minor | The debug variant of the ftpc library has been updated to perform additional checking (as with other BlueLab libraries). |
| B-5498 | Minor | The debug variant of the ftps library has been updated to perform additional checking (as with other BlueLab libraries). |
| B-5510 | Minor | GAVDP_CONFIGURE_CODEC_IND message no longer includes a media_sink field. This field was invalid and the SEID should be used to identify the connection. |
| B-5514 | Major | Fixed a bug in the AVRCP state machine of the av_headset_hfp and av_headset applications where receiving a START with an AVRCP connection already established would confuse the state machine and prevent remote control commands being sent to the source. |
| B-5525 | Minor | Ringtones can now be played from locations other than VM constant space, such as stack memory or dynamic memory. |
| B-5526 | Minor | Playing ringtones from the file system via audio sequence rather than using streams is no longer supported. |
| B-5527 | Minor | A number of fields in library messages have been renamed in order to conform with BlueLab coding conventions. Messages with pointer fields name ptr have had their length field renamed to size_ptr. |
| B-5528 | Major | gcc no longer overwrites arguments in functions which use partially initialised unions. |
| B-5533 | Minor | The av_headset_hfp headset application now accepts an incoming AVRCP connection when it is in the "ready" state. Previously it refused and then opened later. |
| B-5543 | Minor | The gavdp library will now always return a GAVDP_START_CFM when there is a crossover between two devices directing GavdpStart at each other. |
| B-5557 | Minor | A debug variant has been added for the oppc and opps libraries. |
| B-5564 | Minor | When using stream-based RFCOMM connections from a BlueLab application, the RFCOMM streams are destroyed less aggressively. This means that the sink in an RFC_RELEASE_IND generated by BlueStack is valid whereas previously it was always zero. |
| B-5570 | Minor | The gavdp library now determines whether to send a GAVDP_OPEN_IND or a GAVDP_OPEN_CFM message depending on the device opening the AV channels rather than on the SEP role. |
| B-5585 | Minor | The gavdp library now delays creation of internal data structures until a new connection instance is being created. |
| B-5592 | Minor | The gavdp library now delays creation of internal data structures until a new connection data is being created. |
| B-5598 | Minor | An ftp_server application has been added. |
| B-5601 | Minor | The connection library API functions ConnectionSmSetTrustLevel and ConnectionSmDeleteAuthDevice now return void instead of uint16. |
| B-5610 | Minor | Error robustness of sbc and mp3 decoding improved |
| B-5611 | Fatal | gcc now generates more efficient code for 32-bit by 32-bit multiplication. (This also fixes an issue where the code could be incorrect in rare circumstances.) |
| B-5612 | Minor | ISR (Interrupt Service Routine) now clears all length registers so that routines that are called from an interrupt have the length registers cleared. |
| B-5613 | Minor | The naming convention for Kalimba DSP library routines has changed from $lib_routine to $lib.routine |
| B-5616 | Minor | gcc now generates correct code for multiplying a 32-bit integer by a constant power of 2. |




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| ID | Severity | Description |
|---|---|---|
| B-5623 | Minor | In the `avrcp` library, `AvrcpConnectResponse` no longer expects a bluetooth address to be passed in. |
| B-5624 | Minor | In the `avrcp` library, calling `AvrcpConnect` will now always return a confirmation message if the request fails. |
| B-5625 | Minor | The debug version of the `connection` library now panics if an L2CAP connect response from the client contains invalid parameters. |
| B-5629 | Minor | The `avrcp` library will now return confirmation messages for all API calls when the attempt fails, and not just when they are a success. |
| B-5631 | Minor | The `examples/test_mp3decoder` application has been added to the MP3 add-on for BlueLab. |
| B-5639 | Minor | PSR files have been added to the a`2dp_source_dongle` application to help configure the application for operation as a USB or analogue audio device. (These are selected automatically based on the project settings.) |
| B-5647 | Minor | Reduced the sensitivity of the overflow check in `stream_decode.asm` in order to prevent it firing incorrectly with a bursty audio stream. |
| B-5649 | Major | Putting multiple file systems (or applications) into a single DFU file no longer causes `dfubuild` to fail. |
| B-5658 | Minor | It is now possible for a VM application to specify directly the analogue and digital gain settings for the internal CODEC on certain BlueCore devices.<br>This can be done by setting bit 14 of the gain supplied to `CodecSetInput/OutputGain`. If this is done, bits 0..3 are written to the digital gain register and bits 4..6 are written to the analogue gain register. |
| B-5665 | Minor | For more recent BlueCore variants, the PIO lines used to wake the chip from deep sleep can now be active low. This is controlled by PSKEY_PIO_WAKEUP_STATE. |
| B-5670 | Minor | `AvrcpPassthrough` in the `avrcp` library will now send subunit data to the remote end correctly. |
| B-5674 | Minor | A font lookup library has been added for a particular project (support for this is not present in the supplied firmware.) |
| B-5691 | Minor | Tools and firmware have been modified to allow applications in the read-only filesystem to use a full 64Kwords of code space as well as 24Kwords of constants. (Previously the total of code and constant was limited to 64Kwords.) |
| B-5694 | Minor | The PIOs used to drive the WM8731 are now configured during initialisation of the `codec` library. |
| B-5695 | Minor | The `avrcp` library function, `AvcrpPassthrough`, now correctly truncates vendor data to 255 bytes. |
| B-5702 | Medium | Modified the initial streaming state in `stream_decode.asm` so that it will start playing audio sooner than before. It previously started in poorlink which meant it could be several seconds before audio could be heard. |
| B-5703 | Minor | A bug in the MP3 decoder has been fixed where `reorder_spectrum` wouldn't occur if only the right channel was using short windows. |
| B-5706 | Minor | The Kalimba DSP decoders now start in their gobble state rather than poorlink to avoid an initial silence at the start of tracks. |
| B-5732 | Minor | `BlueFlashCmd` now supports querying BlueCore for the chip version and flash size; this is used to automatically identify suitable firmware. |
| B-5748 | Minor | The `HfpGetBdaddr()` function has now been removed from the `hfp` library API. The address of the remote device can be obtained from the connection sink. |
| B-5749 | Minor | The `HFP_SLC_CONNECT_CFM` message sent from the `hfp` library now includes the sink for the SLC connection. |




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| ID | Severity | Description |
|---|---|---|
| B-5751 | Minor | When the mp3 decoder was requested to skip over an 'mp3 granule' (equivalent to half an mp3 frame) it would actually consume a whole mp3 frame. This caused it to consume data twice as quickly as expected during the 'poorlink' condition. To get around this problem the 'poorlink percentage' in the past had to be half the value that you'd imagine it should have been.<br>This bug has been corrected, i.e. the decoder correctly skips granules (half frames) when requested. |
| B-5752 | Minor | On exiting the poorlink state, the Kalimba DSP decoders now start buffering rather than entering the gobbling state. |
| B-5759 | Minor | In order to be consistent with the other BlueLab libraries the `avrcp` library no longer defines the `AVRCP_DISCONNECT_CFM` message. `AVRCP_DISCONNECT_IND` is used instead. |
| B-5765 | Minor | The `avrcp` library now returns the status `avrcp_invalid_sink` in confirmation messages, if its functions are passed an invalid sink. |
| B-5766 | Minor | The `avrcp` library now always returns the correct confirmation message for the API function called. |
| B-5767 | Minor | `AvrcpSubUnitInfo` in the `avrcp` library now sends the page data correctly. |
| B-5771 | Minor | The `avrcp` library message, `AVRCP_VENDORDEPENDENT_IND`, now contains the command type that was sent from the remote end. |
| B-5775 | Minor | BlueLab upstream messages no longer contain pointers to data that their client must free. All such data is now allocated as part of the message so it is destroyed together with the message. |
| B-5780 | Minor | The `gavdp` library now correctly rejects configurations which are not within the reported capabilities. |
| B-5784 | Minor | All state in the `gavdp` library is now stored in the task instance; previously global data prevented multiple `gavdp` instances with differing client tasks. |
| B-5786 | Minor | The `gavdp` library now correctly rejects configurations which are not within the reported capabilities. |
| B-5788 | Minor | The `appquery` helper utility has been extended to report the traps supported by a firmware build; this is now used by the BlueLab makefiles to decide whether an application should be placed in the read-only filesystem. |
| B-5791 | Minor | A firmware bug has been fixed which prevented `MESSAGE_ENERGY_CHANGED` from being delivered to a VM application. |
| B-5797 | Minor | gcc now generates the correct labels for constant segment jump tables when optimising switches on values it can calculate at compile time. |
| B-5799 | Minor | Passing a null bluetooth address to `AvrcpConnect` in the `avrcp` library will now cause a Panic in the debug build of the library. |
| B-5805 | Minor | The sink is no longer passed in to many of the `avrcp` library API functions. It is stored internally within the library. |
| B-5808 | Minor | The profile instance pointer is now the first field in all messages returned from the profile libraries. |
| B-5819 | Minor | Some type definitions which were only relevant to BlueLab2 applications have been eliminated from the (shared) `vm_if.h` header file. |
| B-5830 | Minor | The VM version of xIDE now provides stack backtracing functionality. CallStack and Backtrace variables windows have been added. |
| B-5863 | Cosmetic | The `pio_if.h` header defined types which were used only for BlueLab2 and has been removed. |
| B-5864 | Minor | The `PcmRoute` and `PcmRateAndRoute` calls now support Kalimba DSP-mode. |
| B-5866 | Minor | Attempting to step over a switch statement in a VM app no longer causes xIDE to lock up in certain circumstances. |




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| ID | Severity | Description |
|---|---|---|
| B-5870 | Minor | The default PIN code for all supplied applications has been changed from "4444" to "8888" |
| B-5871 | Major | The a2dp library now respects the local bitpool parameters set during initialisation. |
| B-5874 | Major | gcc3.3 is now less likely to fail with an internal error while compiling calls to memcpy involving pointers to pointers. |
| B-5890 | Minor | A optimisation to the startup code for VM applications has saved one word of RAM in the global variables. |
| B-5891 | Minor | The hfp library now handles CL_RFCOMM_CONTROL_IND messages sent by the connection library. |
| B-5893 | Minor | The tools in BlueLab now support the read-only filesystem on 6-Mbit parts with suitable firmware. (Previously 8-Mbit parts were required.) |
| B-5894 | Minor | Step over/into now copes with larger switch statements when debugging VM applications. |
| B-5898 | Minor | As issue has been resolved which could cause warbling in the right channel when the MP3 decoder was decoding from mono. |
| B-5901 | Minor | Some variables that were in scope were not shown when debugging a VM application. These variables now appear correctly. |
| B-5906 | Minor | The combined headset application now checks its current state before attempting to close the AVRCP connection. |
| B-5909 | Minor | The six functions to set the input and output gains in the codec library, have been replaced by two, where the channel that should be affected is now passed into the function. |
| B-5910 | Minor | CLASS_OF_DEVICE is no longer defined in the spp library. The type named deviceType that was passed into SppInit has been renamed as spp_device_type. |
| B-5914 | Minor | The examples/test_headset application has been removed; it was incomplete and will be replaced by a fully featured headset application in a later BlueLab release. |
| B-5915 | Minor | The SBC and MP3 decoders are now better at correcting byte alignment when re-synchronising. |
| B-5918 | Minor | A debug variant of the avrcp library is now built by default when installing Bluelab. |
| B-5919 | Minor | The combined headset application now sends a button press to the AG if connected as HSP after an HFP connect has failed. |
| B-5920 | Minor | The interface to the goep library has been substantially updated to make it more understandable and more consistent with other BlueLab libraries. |
| B-5921 | Minor | The AvrcpPassthrough and AvrcpVendorDependent interfaces have been changed so that vendor data is passed as a Source and they handle it correctly. |
| B-5926 | Minor | The hfp library API now complies with the BlueLab library coding standard. |
| B-5934 | Minor | spp library code to connect the rfcomm stream to the UART and to operate LEDs has been moved to the application. The connect confirmation status has now been changed from type rfcomm_connect_status to spp_connect_status. |
| B-5945 | Major | The a2dp library now uses kalimba_standard_messages.h for the kalimba message types. |
| B-5946 | Minor | The connection library API now complies with the BlueLab library coding standard. |
| B-5949 | Major | BlueLab now probes over SPI to automatically identify which hardware you are using, both BlueCore variant and flash size. As a result the 'hardware' project property in xIDE has been removed. |
| B-5955 | Minor | BlueLab now includes 'compact' firmware builds that support the read-only filesystem (but not DFU) on 6-Mbit parts. These allow applications to exceed 32Kwords on 6-Mbit parts. |




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| ID | Severity | Description |
|---|---|---|
| B-5967 | Minor | AV streaming has been improved so that the start of a track will play straight away rather than 200ms being lost. Also the poorlink state is now less likey to be entered and so previous mute periods between audio tracks should not exist any more. |
| B-5972 | Minor | The power table in the `gavdp` library now uses passive mode. |
| B-5978 | Minor | The firmware now correctly handles overlapping calls to `AdcRequest`; previously using the battery library to sample two sources could result in no readings being produced. |
| B-5988 | Minor | The `gavdp` library no longer panics during `A2dpOpen` if the signalling channel establishment failed; checks have been added to make sure the signalling channel is valid when looking for a stream endpoint. |
| B-6029 | Minor | `MESSAGE_SOURCE_EMPTY` has been added. |
| B-6053 | Minor | The interface to the `ftpc` library has been updated to make it more consistent with other BlueLab libraries. |
| B-6059 | Major | `MESSAGE_STREAM_DISCONNECT` is now sent to the task associated with the sink; previously it was only sent there if no task was associated with the source. |
| B-6060 | Minor | The `gavdp` library no longer rejects connections from devices that have their MTU set to less than the L2CAP default MTU (672 bytes). The library will now accept a connection from a remote device advertising any legal MTU. |
| B-6062 | Minor | The combined headset application correctly updates its internal state when notified of an incoming call while currently in an active call. |
| B-6068 | Minor | Debounce settings can now be specified in `.button` files using `debounce` *samples delay* . |
| B-6071 | Minor | Low power table support has been added to the `spp` library. |
| B-6073 | Minor | The `av_headset_hfp` application now uses the `codec` library. |
| B-6104 | Minor | The `Connection` library manages a list of trusted devices. The list is keyed by Bluetooth address. A new API has been added to allow additional device attributes to be stored.<br>- `ConnectionSmSetAttribute(..)`<br>- `ConnectionSmGetAttribute(..)`<br>This API can be used to store and retrieve attribute data for a device keyed by Bluetooth address. |
| B-6105 | Minor | The default L2CAP configuration in the `connection` library now sets the local MTU to 895 bytes, the maximum we can support, rather than 672 bytes. |
| B-6107 | Cosmetic | kalasm2 no longer prints out random characters instead of meaningful strings as part of some warning and error messages. |
| B-6110 | Major | The `gavdp` library now correctly updates its internal state if a suspend request is rejected by the remote end. This was causing it to reject subsequent suspend requests from the remote end. |
| B-6117 | Minor | The Kalimba DSP decoder code has been adjusted to eliminate ticks which were sometimes heard at the beginning of a track. |
| B-6123 | Minor | When reading or writing data to a Kalimba DSP port, you can now force different settings, for big/little endian and sign extension, than the defaults. To use different settings from the defaults the port identifiers can now be defined with the following extra definitions:<br>`$cbuffer.FORCE_BIG_ENDIAN` or `$cbuffer.FORCE_LITTLE_ENDIAN`<br>and<br>`$cbuffer.FORCE_SIGN_EXTEND` or `$cbuffer.FORCE_NO_SIGN_EXTEND` |
| B-6124 | Major | The `connection` library no longer leaks memory when its client attempts to connect to an invalid Bluetooth address. |




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| ID | Severity | Description |
|---|---|---|
| B-6129 | Minor | The interface to the `ftps` library has been updated to make it more consistent with other BlueLab libraries. |
| B-6143 | Minor | `ConnectionSmDeleteAllAuthDevices(..)` previously failed to remove all devices from the paired device list. |
| B-6152 | Minor | A firmware change means that the sink value in `DM_EX_SCO_DISCONNECT_IND` primitives is now correctly set, rather than being zero. |
| B-6153 | Minor | The `av_headset_hfp` application now checks stream validity before routing SCO to the PCM hardware. |
| B-6155 | Minor | Freeing a pointer which points into the middle of an allocated region (rather than the start of the region) now causes a VM panic. |
| B-6163 | Minor | If the remote end initiates closing the media channel the `gavdp` library waits for 500ms (thus allowing the remote end to disconnect the signalling channel) before initiating a disconnect of the signalling channel, if it is still connected. Previously it would disconnect the signalling channel immediately. |
| B-6165 | Minor | The `a2dp` and `gavdp` libraries now provide a `CloseAll` function to clean up all existing AV connections. |
| B-6177 | Minor | The `gavdp` library no longer tries to use a signalling connection that doesn't exist. |
| B-6178 | Minor | The `gavdp` library now does some additional checking on the result of a `SinkClaim`. |
| B-6179 | Minor | The `oppc` library API has been updated as part of the changes to the `goep` API. |
| B-6188 | Minor | Code has been added to prevent changing track, or playing of very short sound clips, resulting in a short clip of the last sound being played. |
| B-6194 | Minor | If the AG does not support an in-band ring tone but opens a SCO while sending RING indications, the combined headset application will now play its own ring tone. |
| B-6198 | Minor | A new 'Message' tab in xIDE traces messages passed to the tasks in the application, both from other tasks and from the firmware. |
| B-6208 | Minor | The `a2dp` and `gavdp` no longer contain a `media_sink` field in their CODEC settings indication messages. |
| B-6210 | Minor | The `opps` API has been updated to match the new `goep` API. |
| B-6214 | Minor | An `opp_server` application has been added. |
| B-6217 | Minor | A minor issue in the firmware has been resolved which could mean updates to local variables placed at `0xFFF8` were ignored by xIDE. |
| B-6230 | Minor | `SinkIsValid` and `SourceIsValid` library routines have been added. |
| B-6233 | Minor | A debug variant of the `spp` library is now built by default when installing BlueLab. |
| B-6234 | Minor | The `opps` library no longer assumes that vCard mime types will all be lower case. |
| B-6245 | Minor | The `hfp` library now correctly hangs up the active call if a second call comes in and the application issues an `HfpTerminateCall` request. |
| B-6259 | Minor | gcc no longer allows bitfields to straddle word boundaries any more. Doing so generated extra code and broke applications which made assumptions about structure packing. |
| B-6275 | Minor | An `obex_server` application has been added. |
| B-6276 | Fatal | The `gavdp` library now correctly validates the service capabilities received in a get capabilities response. |
| B-6283 | Minor | The `examples/oppc` application has been added. |
| B-6284 | Minor | DFU tools have been included with BlueLab in tools/dfu. |
| B-6286 | Minor | The AG may optionally include an alphanumeric representation of the number sent in the CLIP indication. If the hfp receives this it sends a single `HFP_CALLER_ID_NAME_IND` message to the client containing this string. |
| B-6287 | Minor | The Kalimba DSP message library has been updated to avoid corrupting the timer list when the firmware took longer than expected to acknowledge a message. |




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| ID | Severity | Description |
|---|---|---|
| B-6330 | Minor | Any streams connected to the Kalimba DSP are now disconnected before a new Kalimba DSP application is loaded by KalimbaLoad; previously the firmware could believe that streams were still connected, despite the Kalimba DSP having been restarted. |
| B-6347 | Minor | A warping operator has been added to the Kalimba DSP libraries allowing `stream_decode` to maintain buffer levels at the good working level. This supports source and sink having non perfect sampling frequencies and helps to conceals flaws in encoders with poor buffer-level jitter control. |
| B-6375 | Minor | The `connection` library now waits for the client to read the `CL_L2CAP_DISCONNECT_IND` message before acknowledging the disconnect. |
| B-6380 | Minor | `PcmRateAndRoute` to internal CODECs on kalimba will now rejects 48kHz for the ADCs since it is not supported by the hardware. |
| B-6386 | Minor | The `hfp` and `a2dp` libraries now allow their client task to supply a service record to be registered instead of the default service record for that profile. |
| B-6417 | Minor | The `hfp` library now returns more specific error codes if the SLC attempt fails so its client can differentiate between a connect fail due to page timeout and the remote device not supporting the requested service. |
| B-6439 | Minor | A `connection_id` field has been added to the `CL_L2CAP_CONNECT_CFM` message sent by the `connection` library. |
| B-6447 | Minor | The Kalimba DSP profiler library no longer requires explicit calls to `profiler.register` before the first call to `profiler.start`. |
| B-6448 | Minor | To be more consistent with other Kalimba DSP libraries the names of some constants have been changed. For example:<br>`$codec.STREAM_ENCODER_IN_LEFT_BUFFER_FIELD`<br>has been changed to:<br>`$codec.stream_encode.IN_LEFT_BUFFER_FIELD` |
| B-6451 | Major | The Kalimba DSP loop registers are now reset during `KalimbaLoad`; previously they were left alone. If, as a result of switching Kalimba DSP applications, this left them pointing to the first instruction in a loop, the Kalimba DSP could branch to a random address. |
| B-6483 | Minor | The structures used to configure the profile library instance for the `hfp` and `a2dp` libraries have been renamed to `hfp_init_params` and `a2dp_init_params` respectively. |
| B-6503 | Minor | The `hfp` library now ignores RING indications if the AG sends them before the SLC is fully established. Both ends are forbidden (by the profiles) from sending any signalling messages until the SLC has completed. |
| B-6505 | Minor | Scripts to help Matlab users to inspect Kalimba DSP state (such as buffer levels) have been added to the `tools/matlab` directory. |
| B-6510 | Minor | A subtle bug in the gcc register allocator caused gcc to delete an instruction that was necessary in some obscure circumstances. |
| B-6555 | Minor | Improved interop of Bluestack by always exiting sniff mode or park mode before opening a SCO or eSCO link. It was seen that certain phones would always reject a SCO connection if the ACL was in sniff. |
| B-6597 | Minor | The firmware implementation of `StreamConnectDispose` has been optimised when applied to common case of region, file and audio sources. |
| B-6598 | Minor | The `av_headset_hfp` application no longer attempts to configure the ADC to a rate the hardware does not support. |
| B-6601 | Minor | When connecting an Audio Source to the Kalimba DSP, garbage data was occasionally sent. This has been fixed. |
| B-6631 | Minor | At above maximum amplitude saturation now correctly occurs. |




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| ID | Severity | Description |
|---|---|---|
| B-6641 | Major | The MPEG-2 extended sample rates have been removed from the MP3 capabilities in the a2dp library because these are not supported by the Kalimba DSP application. |
| B-6694 | Major | Calls to StreamConnect with a SCO stream no longer fail if the SCO connection is in the process of being closed by the baseband but the VM application has yet to be informed. |
| B-6699 | Minor | A memory leak when connecting to an invalid Bluetooth address has been fixed in the goep library. |
| B-6901 | Fatal | BlueFlash and BlueFlashCmd no longer report errors writing to sector 64 on BlueCore 3 when using certain flash devices. |
| B-6906 | Fatal | The version of strncpy supplied as part of the BlueLab libraries could illegally access memory beyond the bound given on the source string. This has been fixed. |
| B-6941 | Major | xIDE no longer reports nonsense values for the contents of a service record when logging a SDS_REGISTER_REQ in the BlueStack tab. (In unusual circumstance the firmware could panic while logging such a primitive.) |
| B-6980 | Major | The AVRCP library now leaves data in the source until a response has been sent; previously it would hold the data in a dynamic block which caused problems with stacks (such as the iPaq HX2415) which sent multiple AVRCP messages without waiting for an acknowledgement. |
| B-6983 | Major | A problem has been resolved which could, in unusual circumstances, lead to gcc3 generating incorrect code when switching on a variable and then referencing the variable soon after the switch. |
| B-6996 | Minor | The spp_dev_a application no longer looks for an exact class of device match during an inquiry result. |
| B-7203 | Major | If the connection library receives an L2CAP connect response and cannot find the internally stored data for this connection it will now send a CL_L2CAP_CONNECT_CFM message to the client indicating this rather than panicking. |
| B-7217 | Major | The hfp library now allows audio transfer when in the incoming and outgoing call states. |
| B-7246 | Minor | Reference documentation for the Kalimba DSP library code is now included and accessible from xIDE's help panel. |
| B-7265 | Minor | The CVSD filter is now available when using SCO streams. |
| B-7319 | Major | The gavdp library could fail to attempt a role switch even when the device was configured as an AV sink. This could result in degraded throughput and poor AV performance and has been fixed. |
| B-7360 | Minor | The hfp no longer leaks memory when an HfpSlcConnect() is issued with the extra_indicators parameter set and the connect attempt fails. |
| B-7370 | Minor | The hfp library has been updated to use a longer sniff interval. |
| B-7386 | Minor | The gavdp library now cleans up its state properly if it attempts to open a transport channel and this attempt fails. |
| B-7388 | Major | The av source dongle application now correctly handles an A2DP_CODEC_SETTINGS_IND message from the a2dp library if the remote device is initiating the AV connection. Previously it was not expecting that message in that state and would panic. |
| B-7402 | Minor | The hfp library now correctly parses +CCWA indications sent from the AG with fewer parameters than required by the HFP specification. |
| B-7405 | Minor | The avrcp library has been updated so it can be configured to support either the target or the controller role. The correct UUID is inserted into the service record registered by the avrcp library depending on the role selected by the client. |
| B-7433 | Minor | This release of firmware adds support for slave mode I2S audio. |
| B-7439 | Minor | Explicit support for MBM29SL800BE was missing from BlueFlash and BlueFlashCmd. It has been added. |




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| ID | Severity | Description |
|---|---|---|
| B-7638 | Minor | A demonstration version of the CVC DSP code has been added to the `av_headset_hfp` application (this can be enabled by defining `INCLUDE_CVC` in the project properties.) |
| B-7693 | Major | The `EnergyEstimationOn/Off` functions no longer fail if the SCO sink is connected to a source. |
| KEX-20 | Minor | A spurious read has been eliminated from the gargle filter. This caused the audio to sound gargled even when the filter was off. |
| KEX-23 | Minor | A tone generation example has been added, making use of the Kalimba DSP to generate the tones, and the VM to parse instructions typed by the user into an interface such as HyperTerminal. |
| KEX-28 | Minor | BlueLab3.2 kalimba examples have been updated to align with the current naming convention. To that end modules are now named using the following convention: `$M.modName` not `$M_modName`. |
| KEX-29 | Minor | A demonstration of the mix operator has been added to the `test_sbc_loopback` example in BlueLab. |
| M-399 | Minor | Kalimba breakpoints are no longer lost when the Kalimba application is reloaded by the vm. |
| M-412 | Minor | Debug output in xIDE is no longer slower with the BlueCore host transport set to none, and in general performance and robustness of the SPI transport has been improved. |
| M-427 | Cosmetic | The debug transport for xIDE can no longer be 'unset' by dismissing the debug transport dialog without making a selection; which could prevent the debugger making contact with BlueCore. |
| M-442 | Minor | The accuracy of timestamps in the xIDE primitive trace has been improved. |
| M-571 | Minor | If the pre-processor symbols used in a Kalimba DSP project are changed, xIDE will now force a rebuild of the assembler source code. Previously, a manual 'clean' step was required to force this to happen. |
| M-577 | Cosmetic | The version of BlueLab being used in now displayed in the title bar of the main xIDE window. |
| M-595 | Major | Expanding certain items in the variable widget (especially pointers) could cause xIDE to crash. This no longer occurs. |
| M-596 | Minor | xIDE can now parse debug information for code with variables declared as `volatile'. |
| M-599 | Minor | Certain variables were displayed as ???? in the xIDE debugger. These variables are now read correctly. |
| M-690 | Major | xIDE should now correctly handle setting breakpoints in Kalimba DSP source files. Previously it could refuse to set them if the file was opened from the File menu, rather than from the project file list. |

**Table Appendix C.1: Issues Resolved in BlueLab v3.2**




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# Appendix D Issues Resolved in BlueLab v3.3

The following issues have been fixed since BlueLab v3.2 was released.

| ID | Severity | Description |
|---|---|---|
| B-514 | Minor | gcc saves constant memory by placing zero initialised global variables into a memory segment that is zero initialised at start-up. They were previously treated in the same way as any other constant initialised variables. |
| B-3551 | Minor | The GOEP & FTP client libraries now implement the optional OBEX level authorisation feature. |
| B-3584 | Minor | HID streams and transforms have been added to BlueLab3. |
| B-4355 | Minor | The `connection` library has been optimised to use fewer globals. |
| B-4801 | Minor | `PcmClearRouting` and `PcmClearAllRouting` calls have been added to the PCM library; these are convenience functions which are equivalent to calling `PcmRateAndRoute`. |
| B-4804 | Minor | Type B instructions (those involving a constant) can contain only one memory access, but Kalasm2 would incorrectly accept code of the form `r? = M[r?] + M[k16]`, generating code corresponding with the instruction `M[k16] = rN +rN` instead of reporting an error. This is now fixed. |
| B-4826 | Minor | Support of Radio Power Tables for EDR has been added,(PSKEY_LC_ENHANCED_POWER_TABLE) in PSTool. |
| B-4832 | Minor | Kalasm2 would incorrectly interpret binary '-' as '+' in some circumstances, such as in the code: `r1 = M[r1 - 1]`; This is now fixed. |
| B-4833 | Minor | kalasm2 would incorrectly accept `M[r1-r2]` in an instruction. This has now been fixed. |
| B-5093 | Minor | kalasm2 would incorrectly accept rMAC sub-registers as source operands, coding them simply as rMAC. This is now fixed. |
| B-5136 | Minor | kalasm2 now outputs a memory usage summary for code and data groups. |
| B-5211 | Major | The `ChargerEnable`, `ChargerSupressLed0`, and `ChargerStatus` functions have been added to support the charger hardware on BlueCore4-Audio ROM. Where appropriate these functions also support the charger hardware on BlueCore3-Audio Flash. |
| B-5214 | Minor | The functions `PioDimLed0` and `PioDimLed0` have been added to control the dimmed LED hardware on BlueCore4-Audio ROM. |
| B-5778 | Minor | The `mp3_decoder` project files for `stereo_headset` application have been moved into the BlueLab mp3 add-on and are not installed by default. |
| B-5836 | Minor | `VmSetPcmClock` will now return FALSE when passed illegal values; previously it would indicate success but ignore the value. |
| B-5896 | Minor | Using xIDE to single step and step over VM code is now faster. |
| B-6091 | Minor | The automatic gain control algorithm used by BlueCore has changed, in a way which should reduce power consumption. The residual bit error rate on D8PSK is enhanced, and the maximum input signal level (primarily EDR) is raised. |
| B-6116 | Minor | Support for HID (Human Interface Device) has been added. |
| B-6212 | Cosmetic | gcc now has certain optimisations on small leaf functions turned on by default. |
| B-6227 | Minor | The `ConnectionWriteInquiryAccessCode` function has been added to the connection library. |
| B-6281 | Major | When streaming SBC audio from the `a2dp_source_dongle` to the `av_headset_hfp`, there were glitches every several hours. This was due to clock drift between the two devices. The problem has been addressed by DSP changes in B-6347. |




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| ID | Severity | Description |
|---|---|---|
| B-6505 | Minor | Scripts to help Matlab users to inspect DSP state (such as buffer levels) have been added to the `tools/matlab` directory. |
| B-6512 | Minor | The rfcomm primitive set has been extended to include `RFC_EX_ESTABLISH_IND` primitive which contains the Bluetooth address of the remote device. If extended primitives are enabled this is sent instead of the `RFC_ESTABLISH_IND` primitive. |
| B-6516 | Minor | Debugging code built with leaf optimisation no longer breaks the Call Graph functionality. (This includes the library code supplied with BlueLab33.) |
| B-6521 | Minor | VM extended versions of the Device Manager Synchronous Connection primitives have been added. |
| B-6749 | Minor | The `DM_SCO` primitives have been removed from Bluestack as they have now been deprecated by the `DM_SYNC API`. |
| B-6800 | Cosmetic | Accessing L2CAP and RFCOMM data through streams is now mandatory. (This feature has always been used by the BlueLab3 connection library.) The ability to receive `DATA_IND` primitives from BlueStack has been removed, along with the parameters to `StreamConfigure` to control this. |
| B-7030 | Minor | Added `DM_EX` versions of the `DM_SYNC_RENEGOTIATE_xxx` primitives which allow the VM to reference a connection using the Sink rather than HCI handle. |
| B-7033 | Minor | A new feature has been added to the VM to allow it to access the USB Isochronous Out endpoint. This allows a device to send PCM audio to USB Host, such as a PC. |
| B-7036 | Major | `connection` library L2CAP connections can now be handled by tasks other than the one registered to the PSM. |
| B-7042 | Minor | A new AGHFP library implementing the audio component of the hands-free profile has been added. |
| B-7050 | Minor | xIDE will now relink a VM application if it detects that a library has changed. |
| B-7092 | Minor | The library call `CodecSetSideToneGain` has been added to control the sidetone gain on BlueCore4-Audio ROM. |
| B-7097 | Minor | The MP3 decoder libraries available for BlueLab now support mpeg2 and mpeg2.5 sample rates of 8-22.025KHz. |
| B-7159 | Minor | Previously, kalasm2 displayed the string `NO VERSION CONTROL` instead of a version number. A version number has now been added, and should be quoted in requests for help. |
| B-7160 | Minor | The version of gcc included with BlueLab now includes the BlueLab version number when you pass `--version` on the command-line. |
| B-7224 | Minor | The `VmTransmitEnable` function has been added to disable the transmitter. |
| B-7266 | Minor | The `hfp` library now uses the `hfp_connect_rejected` status code in the `HFP_SLC_CONNECT_CFM` message if the connect attempt fails due to the remote end rejecting the connection. |
| B-7321 | Minor | The `connection` library now requests profile libraries to vote with their link policy settings on rfcomm disconnect. |
| B-7354 | Minor | The `connection` library now asks tasks with sinks on a given ACL to vote with their link policy settings every time an audio connection is connected or disconnected on that ACL. This allows a profile library to specify a different link policy if it has an audio connection open |
| B-7437 | Fatal | The unusual case of `StreamConnect` from the DSP to the DSP from a VM application is now handled correctly in the firmware. |
| B-7452 | Fatal | The firmware could panic when a `DM_EX_SYNC_CONNECT_COMPLETE_IND` was generated with a status other than success. This has been fixed. |




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| ID | Severity | Description |
|---|---|---|
| B-7476 | Minor | The following new codec gain control traps have been added:<br>`CodecSetRawInputGainA`<br>`CodecSetRawInputGainB`<br>`CodecSetRawOutputGainA`<br>`CodecSetRawOutputGainB`<br>`CodecEnableMicInputGainA`<br>`CodecEnableMicInputGainB.` |
| B-7490 | Minor | The `gavdp` library now cleans up all connections properly if remote end does not respond to a CLOSE request. |
| B-7493 | Minor | IR OBEX has the concept of parameters that are specific to a particular application. This has been implemented. |
| B-7501 | Cosmetic | Final negotiated parameters (link type and bandwidths) are now passed to an application on successful creation of a synchronous connection. |
| B-7502 | Minor | The `hfp` library will no longer inform its client of `+CNUM`, `+BTRH` or `+CLCC` notifications, sent by an AG, if they contain parameters that are out of spec. |
| B-7507 | Minor | xIDE can now create `.button` or `.parse` files in BlueLab. |
| B-7584 | Minor | The `hfp` library now passes a `HFP_CALLER_ID_IND` message to the client even if the AG did not send the number of the caller. |
| B-7611 | Major | If a file was selected and successfully downloaded then changing the filename and trying to do a subsequent download caused a crash. This has been fixed. |
| B-7747 | Minor | The VM will now immediately panic an application which attempts to call a NULL function pointer. Previously it would mysteriously restart the application. |
| B-7762 | Minor | The `spp` library now handles the `MESSAGE_SOURCE_EMPTY` message. |
| B-7792 | Minor | The `avrcp` library now stores the service records it needs in constant space. |
| B-7801 | Minor | The battery charger current on BlueCore4-Audio ROM can now be controlled from the VM application using the `ChargerSetChargeCurrent` call. |
| B-7831 | Minor | If a `.button` file is included in an application, PIO states are now read immediately when the application starts, so events are reported as defined in the `.button` file from startup. |
| B-7841 | Minor | `Buttonparse` can now decode PIO events that are separate from PIOs that are used for buttons. |
| B-7862 | Minor | Previously, Kalasm2 would not allow code to completely fill available program memory, because automatically generated zero prefix instructions were being counted, despite these being stripped out at link time. This problem has now been fixed. |
| B-7944 | Major | An issue has been resolved in BlueFlash which could lead to it reporting an incorrect firmware ID. |
| B-7952 | Minor | An issue has been resolved in the SPI transport which could prevent tools such as BlueFlash and xIDE in BlueLab from correctly identifying the chip being used. |
| B-7953 | Minor | The `hfp` library message `HFP_INTERNAL_SDP_REGISTER_CFM` is now allowed in the connecting state. |
| B-8000 | Minor | The BlueLab reference documentation is now built at the same time as the VM libraries, so it automatically reflects any local changes that might have been made. |
| B-8011 | Minor | A display library has been added for controlling an LDA33S481J1D module (containing an PCF8548 LCD controller) over $I^2C$. |
| B-8040 | Minor | HFP will now issue a request for extended error result codes if the AG supports them. |




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| ID | Severity | Description |
|---|---|---|
| B-8047 | Minor | The CL_DM_MODE_CHANGE_EVENT message has been added to the connection library to allow the application to monitor power-saving settings. Applications must call ConnectionInitEx with suitable parameters to enable this message. |
| B-8115 | Minor | The gavdp and a2dp libraries now notify their client when link loss occurs with a new error code in the close message. |
| B-8139 | High | HFP will now inform applications of the phone number type (i.e. national, international etc) when +CNUM, +CLIP, +CCWA and +CLCC notifications are received from the AG. |
| B-8153 | Minor | The hfp library now sends VGS commands when connected over an HSP connection with a Fujitsu F900iT. |
| B-8214 | Minor | A problem has been observed when BlueCore is in a scatternet or piconet with two links, one of which is in sniff and the other is streaming data to BlueCore. A typical use case is an AV headset that is streaming AV data from a PC while also connected to a phone, which periodically unsniffs the link and sends data such as signal strength reports.<br>When the sniffed link is unsniffed, BlueCore pauses data on all links during the unsniff of the sniffed link, unpausing afterwards. This causes delays in the data on the streaming link, which lead to breakups in an audio stream.<br>The firmware has been changed so that it does not pause data on all links in this scenario. This resolves the problem in the case where the headset is master of both links and in the case where the headset is master of the AV link and slave of the phone. Work to support other scatternet scenarios is ongoing. |
| B-8264 | Major | The cbop operator upsample and mix would incorrectly update the parameter structure (corrupting the linked list) if it was used as two mono operators processing a stereo stream. This has been fixed. |
| B-8292 | Major | The hfp library has been modified to correctly parse all possible formats of +CLCC, +CNUM and +COPS notifications received from an AG. |
| B-8316 | Fatal | When running higher layers on chip (either with a VM application or when using BCHS with L2CAP or higher layers on chip) and when running more than one simultaneous connection, it was possible for the firmware to leak flow control tokens until eventually L2CAP data flow would stop on all but one link (and that link might run slowly). This has been resolved. |
| B-8318 | Minor | The StreamEnableSniffSubrating calls has been added to enable subrating on a connection. |
| B-8416 | Minor | During a GOEP connect request where the server forces authentication, a client can cancel the request by issuing a disconnect. GOEP accepts the disconnect and cancels the connect request. |
| B-8430 | Minor | A change has been made to the code generator for gcc which can prevent a fatal register spill when comparing 32-bit values. |
| B-8435 | Minor | A headset application, based closely on BC4-headset, has been added to BlueLab. |
| B-8441 | Major | gcc no longer experiences an internal compiler error in certain code involving a memcpy between structure elements. |
| B-8455 | Minor | A new stereo_headset application (corresponding to BlueTunes1) has replaced the av_headset_hfp application which shipped with BlueLab3.2. |
| B-8460 | Minor | With an active SLC in sniff mode, data sent over the link will force the link exit sniff and become active for 1 second. Previously, this was 5 seconds. Some phones spam the headset with CIEV messages which resulted in higher standby current consumption. |
| B-8473 | Minor | gcc no longer experiences an internal compiler error in certain code involving a memcpy between structure elements. |
| B-8493 | Minor | An enhanced firmware variant for BlueCore3-Multimedia has been added to BlueLab3.3 which offers limited EDR support. |




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| ID | Severity | Description |
|---|---|---|
| B-8497 | Major | gcc no longer generates invalid multiplies by register AH and AL. |
| B-8536 | Minor | `genparse` no longer needs the `–task`, `-dict` and `-find` command-line options; they are now the default. |
| B-8538 | Minor | The connection library no longer sends a `CL_RFCOMM_DSICONNECT_IND` message to the client task if the local device rejected the rfcomm connect attempt. |
| B-8553 | Minor | The USB Audio EndPoint descriptor in the `a2dp_source_dongle` application has been updated to include the `bRefresh` and `bSyncAddress` fields required by the USB2.0 chapter 9 tests. |
| B-8577 | Minor | Previously, kalasm2 allocated addresses to code and data based on which group had the least space remaining. This has been improved, such that group allocation follows the order of segment declarations in `default.asm`. For example, given a segment declaration DM corresponding to two groups, DM1Group and DM2Group, then, for any allocations to segment DM, DM1Group will be filled to capacity before any data is allocated to DM2Group. |
| B-8607 | Minor | A `unified_no_fs` firmware variant for BlueCore4-External has been added to BlueLab3.3 for specific applications which cannot use the read-only filesystem. |
| B-8615 | Minor | The gcc code generator has been improved to give slightly smaller output in certain code similar to a-=b where a is 32-bits wide and b is 16-bits wide. |
| B-8728 | Cosmetic | The accuracy comments of the sin routine have been updated, as they previously implied it was less accurate than it actually is. |
| B-8731 | Minor | The PSKEY_ prefix has been removed from the Programmer IDs. This helps location of keys by allowing skipping to a key in PSTool by pressing the letter it begins with. |
| B-8786 | Minor | Firmware support has been added for Persistent Store reading from the DSP. |
| B-8787 | Minor | Firmware support and VM access have been added for passing longer messages between the DSP and the application. |
| B-8824 | Cosmetic | If the selected firmware cannot be found for the hardware in use, xIDE now produces a sensible error message (previously it would complain about being unable to determine if the firmware supported the filesystem). |
| B-8841 | Minor | The identifiers for some BlueCore variants were out of date. These have been updated. |
| B-8886 | Minor | The `connection` library now correctly rejects an rfcomm connection attempt from a remote device when the channel is already in use |
| B-8919 | Minor | gcc no longer generates incorrect code for certain obscure circumstances involving sign extension of bit fields. |
| B-8944 | Minor | The `codec_decoder` Kalimba app sometimes produced slight ticking clicks in the right earphone. This was due to the interrupt rate for audio copies not being quite fast enough in certain instances. To speed up the interrupt rate the timer scheduling function `$timer.schedule_event_in_period` is now used rather than `$timer.schedule_event_in` |
| B-8951 | Major | An issue with gcc has been fixed where function pointers in arrays or structs could (in some limited circumstances) cause the compiler to crash. |
| B-8956 | Major | A cross-over audio scenario which could cause interop problems with the Nokia 6230 has been worked around in the `hfp` library. |
| B-9031 | Major | If `EnergyEstimationOn()` was invoked from the VM, even if it returned a success value, no `MESSAGE_ENERGY_CHANGED` would subsequently be generated. This has been resolved. |
| B-9035 | Minor | A new function, `VmAmuxClockEnable` has been added to enable and disable the clock which some BlueCore4 variants can output on AIO0. |
| B-9040 | Minor | Saturation code has been added to the SBC `joint_stereo_processing` routines of the encoder and decoder. Note: Previous tests have not shown overflow occurring, but the addition of some saturation code was thought worth while as a safety measure. |




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| ID | Severity | Description |
|---|---|---|
| B-9042 | Minor | `MessageSystemTask` and `MESSAGE_USB_ENUMERATED` have been added to the VM libraries to allow an application to receive an indication when USB enumeration is complete. |
| B-9043 | Minor | The `cbops` routines `upsample_mix_mono` and `upsample_mix_stereo` incorrectly check the amount of tone data used in each call. This means the routine will always assume there is tone data available to mix. |
| B-9047 | Fatal | Fixed a problem where the USB to-host Isochronous Endpont which had been configured from the VM would be disabled following USB Reset. This prevented USB Audio flowing to the PC. |
| B-9100 | Major | The `codec` library now provides a new API, `CodecSetInputGainNow` and `CodecSetOutputGainNow` for setting the codec gain immediately. |
| B-9172 | Minor | A user editable filter has been added to PSTool's display of PS Keys. |
| B-9175 | Minor | `StreamSourceConfigure` and `StreamSinkConfigure` can now be used for connected streams and have a boolean return value to indicate if the request was not possible. |
| B-9356 | Minor | Nested interrupt support in the Kalimba DSP library has been turned off by default to ease debugging with xIDE. To enable it see the define comment at the top of `interrupt.h` |
| B-9372 | Minor | Fields have been added to the VM USB `EndPointInfo` structure to allow a VM application to append class specific fields to an EndPoint descriptor. |
| B-9374 | Minor | USB enumeration for USB Audio devices has been updated in order to interoperate with MacOS X. |
| B-9413 | Minor | The `VM_SOURCE_MESSAGES` and `VM_SINK_MESSAGES` keys can now be used with `SourceConfigure` and `SinkConfigure` to selectively suppress `MORE_DATA` and `MORE_SPACE` messages. |
| B-9470 | Minor | A bug has been found where by the routines `$cbuffer.set_write_address` and `$cbuffer.set_read_address` could overwrite the memory at address 0. This would only occur if code accessed an MMU port outside of an interrupt when a stream disconnection occurred. This bug has been fixed so that address 0 is not written to. |
| B-9473 | Minor | A connection library API has been added to allow application to register trusted devices. |
| B-9481 | Minor | The `font` library functions are now supported by the unified firmware supplied with BlueLab (previously they were only present in special customer-specific builds.) |
| B-9485 | Minor | Support has been added to kalpac2 and the firmware to allow the DSP on BlueCore3-Multimedia to access data values from flash on BlueCore3-Multimedia_r03 and later. See `examples/kalimba_flash_access_example`. |
| B-9512 | Cosmetic | Shortcuts to PSTool, BlueFlash, VMSpy and AVControl utilities has been added to the **Start** menu. |
| B-9535 | Minor | In `goep_hander.h` function `handleSDPServSrchAttrCfm`, there is a check to see if the returned SDP attribute contains an RFCOMM channel. The code was repeated, a copy of the code has been removed |
| B-9539 | Minor | xIDE now passes `.button` files through the C preprocessor which allows `#ifdef` to be used to adjust for multiple hardware configurations. |
| B-9579 | Minor | Kalimba projects now have individual project properties to allow more useful properties to be listed in a user-friendly way. |
| B-9664 | Minor | In the `test_tonegen` example application in BlueLab the psr file was incorrectly named, matching the name of the Kalimba project not the VM project. |
| B-9727 | Major | DFUWizard is not included with this release of BlueLab. |
| B-9759 | Minor | Values being sent over byte-oriented streams to the host (`StreamHostSink`) could be sign-extended into the adjacent byte. This has been fixed. |




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| ID | Severity | Description |
|---|---|---|
| B-9787 | Minor | The Kalimba Matlab tools `kalvarprs` and `kalprocessor` were locked between calls which meant they were not cleared by clear all. This is unnecessary and the lock has been removed. |
| B-9812 | Major | Attempting to `StreamConnect` a `FileSource` or `StreamAudioSource` to a `PcmSink` when PCM port 0 has been configured to a rate of 0 no longer causes a firmware panic. |
| B-9830 | Major | The `sco_dsp` and `sco_master` example applications have been updated to use `CodecSetRawInputGainA/B` and `CodecSetRawOutputGainA/B` instead of `CodecSetInputGainA/B` and `CodecSetOutputGainA/B`. |
| B-9843 | Major | On BlueCore3-Multimedia, the internal CODECs now operate correctly when routed to slots 2 or 3. |
| M-375 | Minor | Fixes have been made to make stepping Kalimba in xIDE faster. |
| M-463 | Minor | Go To Line now works correctly in xIDE when the active project is a Kalimba project. |
| M-480 | Major | Many problems with multi-project workspaces in xIDE have been fixed. |
| M-524 | Cosmetic | Starting a search in xIDE with some text selected now defaults to searching for that text. |
| M-579 | Cosmetic | An issue has been resolved which could result in xIDE intermittently ignoring uses of **F4** to go to the next compile error. |
| M-591 | Minor | File Open from within xIDE now includes `.button`, `.parse` and `.asm` files in the default filter. |
| M-601 | Major | Changing the number format of a DSP register in the register window in xIDE no longer changes the on chip value of the corresponding register. |
| M-605 | Minor | The BlueStack tab in xIDE now correctly decodes the states in the `DM_LP_WRITE_POWERSTATES_REQ` primitive. |
| M-652 | Major | Hitting the escape key when xIDE dialogues appear now cancels the operation; previously the operation could sometimes proceed. |
| M-664 | Minor | An issue has been resolved which could result in xIDE opening the same file twice in two different buffers. |
| M-699 | Minor | xIDE could fail to display the parameters of functions that don't contain any automatic variables. This has been fixed. |
| M-703 | Minor | xIDE now shows the full path of open files as a tool tip if the mouse pointer is held over the file tab of the editor window. |
| M-726 | Minor | xIDE no longer tries to connect over SPI to identify the chip being used when compiling a single file (using **Ctrl+F7**). |
| M-748 | Major | Using a single workspace for VM and Kalimba projects caused a slowdown in traffic to and from the chip. This has been fixed. |
| M-750 | Fatal | The licence file has been modified to allow use the BlueLab version of xIDE from within a Terminal Services session. |

**Table Appendix D.1: Issues Resolved in BlueLab v3.3**




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# Appendix E Issues Resolved in BlueLab v3.4

The following issues have been fixed since BlueLab v3.3 was released.

| ID | Severity | Description |
|---|---|---|
| B-2770 | Cosmetic | BlueLab3 (especially `make`) does not understand file or directory names containing spaces. BlueLab now enforces this by refusing to install in a directory under **Program Files** (or any other path containing spaces.) |
| B-4522 | Minor | The `avcontrol` application no longer leaks memory if left running with the AV dongle unplugged. |
| B5153 | Minor | `SourceSize` can now return up to 3K for file sources; previously only the next 1.5K of each file could be accessed through `SourceMap`. |
| B-6160 | Minor | kalasm2 no longer crashes if asked to assemble malformed instructions involving a memory access in parallel with reading the result from a division. |
| B-6161 | Major | kalasm2 incorrectly accepted a memory read in parallel with a divide instruction, generating code only for the divide. This problem affected code such as:<br><br>`Div = rMAC / r1 r0 = M[I0, 1];`<br><br>This issue is now fixed and kalasm 2 will report that a semi-colon is expected immediately after the divide instruction. |
| B-6894 | Cosmetic | Attempting to send a message to an invalid task now panics the application immediately. Previously it would be paniced when the memory was accessed during message delivery. This makes it easier to diagnose the source of the problem. |
| B-6975 | Minor | A HID dongle example application has been added. |
| B-7101 | Minor | The Device Manager now returns to Active Mode before issuing a roleswitch to HCI. It previously sent the command irrespective of the mode and hence it could fail. |
| B-7115 | Minor | Firmware changes have improved the Bluetooth bandwidth available to a device receiving streaming data whilst in a scatternet with a third device which was idle but in active mode. |
| B-7365 | Minor | The `pbap_common` library has been added to BlueLab, providing functionality common to both the `pbap` server and client libraries. |
| B-7366 | Minor | The `pbabs` library has been added to BlueLab, implementing the server role of the Phone Book Access Profile. |
| B-7367 | Minor | The `pbabc` library has been added to BlueLab, implementing the client role of the Phone Book Access Profile. |
| B-7375 | Minor | Using `DM_LP_WRITE_POWERSTATE_REQ` to configure new powerstates always resets the state machine to the initial state; previously the existing state was sometimes used. |
| B-7385 | Minor | The behaviour of the DM policy manager has been improved so that it now only retries a failed power mode change a limited number of times. It previously retried indefinitely. |
| B-7901 | Cosmetic | The BlueLab battery library now supports reading the internal charger voltage (for BlueCore4-Audio ROM and BlueCore4-Audio Flash parts.) |
| B-8028 | Minor | kalasm2 now requires that code lines containing multiple expressions should have commas separating them. For example, the following is valid syntax:<br><br>`r3 = M[r3 + r2], r4 = M[I0,1], r5 = M[I4, -1];`<br><br>kalasm2 will, by default, issue a warning for lines which do not have comma separators. The command line flag "-es" promotes such warnings to errors. The command line flag "-ns" causes the presence or lack of separators to be ignored (that is, restores the old default behaviour). These options can be controlled from the project properties in xIDE. |




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| ID | Severity | Description |
|---|---|---|
| B-8225 | Fatal | Previously, kalasm2 reported an unspecified fatal error if source code has a block defined within a block. Nested blocks now report a suitable error message. |
| B-8387 | Major | The `a2dp_source_dongle` example application will no longer panic on the fourteenth connection attempt to an a2dp sink if it is built as an analogue input device. |
| B-8389 | Minor | BlueLab now includes a `hid_keyboard` reference application. |
| B-8918 | Minor | The `genparse` tool now accepts a `prefix` command in the input file which allows multiple AT parsers to co-exist in a single application. |
| B-8967 | Minor | `TestTxData1`, `TestPcmLb`, `TestPcmExtLb`, `TestCfgXtalFtrim`, `TestPcmTone`, and `TestCodecStereoLb` have been added to the `test` library. |
| B-9136 | Minor | The default debug behaviour for new installations of xIDE is now to stop the current processor; previously it would stop all processors. This can be changed using `Tools\Options\Debug`. |
| B-9215 | Fatal | It is no longer possible to crash BlueFlash by attempting to change the transport while a download is in progress. |
| B-9386 | Minor | VM projects in xIDE now understand how to handle the `.parse` files used by `genparse`. |
| B-9589 | Major | The `hfp` library now parses `+CME ERROR` notifications correctly. |
| B-9593 | Minor | The `ConnectionReadLocalName` function has been added to the connection library to return the local friendly name. |
| B-9595 | Minor | The `ConnectionSmGetAuthDevice` function has been added to the `connection` library to allow clients to retrieve link keys after pairing. (Use of this function is unusual since the connection library takes care of storing link keys for the application.) |
| B-9599 | Major | Fixed a rare bug where the HCI would issue two identical Command Status Events (`NOP`, `num_hci_command_packets=1`) when attempting to allow the host to send another command packet. If the host was to send a command after processing the first event, but before seeing the second, a credit mismatch could occur. |
| B-9603 | Minor | Unused parameters have been removed from the `AghfpSlcConnect` and `AghfpSlcConnectResponse` functions in the `aghfp` library. |
| B-9606 | Minor | The AT commands `+CIND` and `+CIEV` in the `aghfp` library now send colons instead of equals signs. |
| B-9653 | Minor | When establishing an RFCOMM connection, parameter negotiation is now performed for all DLCs on a mux. |
| B-9688 | Minor | Calling `ConnectionAuthDevice()` with the Bluetooth Device address of the Default user will now result in the link key of the default device being deleted. The default device will also be removed from the security database immediately. This means that new connections to this device will require authentication. |
| B-9753 | Minor | The `aghfp` library's API has been extended to provide the means to set up/shut down a call to a HS/HF device. |
| B-9811 | Minor | kalasm 2 incorrectly rejected type B add and subtract instructions if they included a memory access on the left of the arithmetic operator. The fault which only applied to opcodes where the AM field is `10` (`0x2`), is now fixed. |
| B-9832 | Minor | The DSP code in the `sco_dsp` example application has been re-written to reduce latency, improve audio quality and serve as a basis for simple SCO processing code development. |
| B-9876 | Minor | The supplied OBEX Server applications now set the Object Transfer bit of the Class Of Device. Although not required in the profile specifications. (except PBAP) some stacks use it for profile support. |
| B-9882 | Minor | xIDE no longer crashes if DSP breakpoints are manipulated but the SPI cable has been unplugged. |




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| ID | Severity | Description |
|---|---|---|
| B-9886 | Minor | A dtmf (Dual Tone Multi-frequency) library has been added to the Kalimba library set. |
| B-9921 | Minor | The DM has been improved so that when an ACL link enters a new Power State, the DM will automatically update the link policy to prevent the remote device changing the low-power mode to an undesired mode. For example, when the powerstate is active, all sniff/park/hold requests from the remote device will be rejected. |
| B-9961 | Minor | `kalstacktrace` now checks if the DSP is loaded as well as running before attempting to read stack data from the chip. |
| B-9965 | Minor | If `kalstacktrace` finds a rogue value in the stack it now displays it in the trace with "`*** Corrupt ***`" to allow the user to try and work out what has happened. |
| B-9984 | Minor | A `hid_mouse` example application has been added. |
| B-9992 | Major | The DSP assembler, Kalasm 2, silently accepted conditional memory writes, even though the Kalimba DSP on BlueCore3-Multimedia always executes the resulting write unconditionally. If assembling BlueCore3-Multimedia code, any attempt to use conditional memory writes will now correctly generate an error. |
| B-10002 | Minor | The `AghfpSetRingRepeatInterval` function has been added to the `aghfp` library to control the behaviour when sending ring indications. |
| B-10046 | Minor | vmSpy now reports the month correctly in its timestamps. Previously it was off by one. |
| B-10083 | Minor | `SourceSize` on a region source is now limited to 3K. Previously it could report more than this for very large constants, but would fail when that memory was accessed through `SourceMap`. |
| B-10110 | Minor | The `Cbops` part of the core library has been split into a separate library. It has been redesigned to provide a more flexible method of routing audio through buffers on the DSP. The copy routines, the operators and the example applications that use the `cbops` library have been updated. |
| B-10136 | Minor | vmbuilder now reports how much space is in use by the filesystem and how much remains. |
| B-10138 | Minor | GOEP now uses `StreamMove` for sending data instead of `memcpy`. |
| B-10140 | Minor | With the fix to B-10138, the `offset` parameter in send packet functions in the `goep` library which take a source became unused. This is because `StreamMove` can only send from the beginning of a source and it drops the data it moves when it finished. The `offset` parameter has been removed. |
| B-10141 | Minor | The `aghfp` library now automatically attempts to negotiate a mutually acceptable SCO link from the specified packet type bit mask. |
| B-10146 | Fatal | The `hfp` library's internal audio connection state is now initialised correctly. |
| B-10178 | Cosmetic | Incorrectly named GOEP source files have been changed from `geop` to `goep` |
| B-10187 | Cosmetic | `AGHFP_CALL_HANG_UP_IND` now replaces `AGHFP_CALL_TERMINATE_IND` as the primitive used to indicate that a HF device wishes to reject/end a call.<br>`AGHFP_CALL_TERMINATE_IND` is now used by the Call Manager to indicate that a call has actually been terminated. |
| B-10273 | Minor | A library (piolib) has been added to allow multiple tasks to receive `MESSAGE_PIO_CHANGED` messages. |
| B-10313 | Minor | Support has been added to SPP to enable it to register DUN SDP records. This means DUN can be a thin wrapper round SPP. |
| B-10580 | Minor | SPP can now forward the `CL_RFCOMM_CONTROL_IND` which DUN needs to perform modem signalling |




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| ID | Severity | Description |
|---|---|---|
| B-10614 | Minor | RFCOMM has been improved so that if it receives an RFC_PARNEG_REQ for an already established DLC, it now responds with an RFC_PARNEG_CFM with the current parameters. It previously did not respond which could cause the client to hang. |
| B-10622 | Minor | A bug has been fixed which meant the SourceConfigure and SinkConfigure of messages always behaved as if VM_MESSAGE_SOME had been passed as the value. |
| B-10632 | Minor | A library implementing the MD5 hash function has been added (this is a VM library and is unsuitable for large volumes of data.) |
| B-10655 | Major | Version 2.02 of kalasm2, as shipped with BlueLab 3.3, incorrectly assembled three instructions involving rMAC sub-register moves. The affected instructions were:<br>`rMAC2 = rMAC0;`<br>`rMAC2 = rMAC1;`<br>`rMAC0 = rMAC2;`<br>Please note that no libraries or applications shipped with BlueLab 3.3 made use of these instructions. This problem is fixed in BlueLab 3.4 (kalasm2 version 2.03). |
| B-10682 | Major | Functions using more than 127 words of local variables no longer confuse the BlueLab linker. Previously it would report an unrealistically low stack usage figure, typically resulting in an application panic as the stack overflowed. |
| B-10687 | Minor | Cleaning a DSP project now removes additional temporary files (those with dm1, dm2, pm, kmap, kpp, or ksm extensions.) |
| B-10695 | Minor | ConnectionWritePagescanActivity no longer claims to have not been implemented when it has. |
| B-10697 | Minor | Firmware changes have been made to the stream subsystem to reduce the latency of data flowing out of the DSP. |
| B-10726 | Major | The stereo_headset application now stores the last codec that was used to stream audio, so when the headset connects back it can use the stored codec. |
| B-10736 | Minor | The stack usage calculation made by the BlueLab linker now includes the run_init function as well as main. Previously it was possible for an application where main was trivial to be given enough stack space to run main but not run_init, resulting an application panic during the run_init function. |
| B-10743 | Major | When used in a configuration where a full Bluetooth stack and a Virtual Machine application are being executed on-chip, it is possible that the responses to an inquiry-with-RSSI operation could be queued for the VM application faster than that application can process them. In extreme cases, this could lead to the queue overflowing and the device becoming unresponsive. This flow control issue has been resolved. |
| B-10775 | Minor | The connection library now supports Inquiry Scan with RSSI. |
| B-10801 | Major | An AghfpSendError command has been added to the aghfp library. |
| B-10818 | Major | The a2dp_source_dongle application, when configured to use the wolfson WM8731, now correctly sets the input gain once the codec has been configured. |
| B-10829 | Minor | The firmware has been updated to prevent the application receiving L2CA_DATAWRITE_CFM primitives which arrive while the link is being disconnected. |
| B-10846 | Minor | When reporting incompatibilities between a VM application and the BlueCore firmware, the vmbuilder tool now reports the functions which are causing the problem. Previously it just reported the trapsets containing those functions. |
| B-11001 | Major | The current consumption of the stereo_headset application in Bluelab v3.4 has been reduced to match that of the av_headset_hfp application in Bluelab v3.2. |
| B-11015 | Major | Several errors have been fixed in the HFP service record of the aghfp library. |




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| ID | Severity | Description |
|---|---|---|
| B-11123 | Minor | A new helper function, `RegionMatchesUUID128` has been added to the region library. |
| B-11134 | Minor | The `aghfp` library will now send blank CLIP notifications if no caller id details have been specified. |
| B-11140 | Minor | The `TransformPollTraffic` function has been added to detect activity on connected streams. |
| B-11141 | Minor | `TransformFromSource` and `TransformFromSink` have been added to find the transform connected to a stream. |
| B-11158 | Minor | The `aghfp` library primitives `AGHFP_AUDIO_CONNECT_CFM` and `AGHFP_AUDIO_DISCONNECT_IND` now use the correct enumerated type for the returned status code. |
| B-11181 | Major | When a VM application was reading data from the USB bulk endpoint, data flow could suddenly stop and never restart. The stream subsystem has been updated to prevent this happening. |
| B-11210 | Minor | Support has been added for Agilent 3030/3040 mouse sensors. |
| B-11225 | Minor | `.psr` files with the name of the project are now passed through the C pre-processor before being passed to pscli. This allows tests for defined symbols to be used in the `.psr` file. |
| B-11228 | Minor | An issue has been resolved which could prevent xIDE from locating source files corresponding to DSP source code. |
| B-11266 | Minor | The Agilent sensor code now checks the sensors product ID and panics if the ID is unknown. |
| B-11276 | Minor | The `hid_mouse` application now supports Agilent 2030/2051 and 3030/3040 in a single application. |
| B-11332 | Fatal | Memory leaks have been fixed that occured when processing `AT+CLIP` and `AT+CHLD` commands. A race condition that could occur when sending an AT command if the underlying RFCOMM sink had just been removed, has been fixed. All issues would have ultimately resulted in a firmware panic. |
| B-11396 | Minor | The `stereo_headset` application now does not enable MP3 support as default. It must be turned on using a user PS key. |
| B-11417 | Minor | GOEP Remote get commands referred to GOEP_REMOTE_GET_DATA_IND this has been corrected to GOEP_REMOTE_GET_MORE_DATA_REQUEST_IND. |
| B-11437 | Minor | Support for the HID keyboard matrix sensor type has been added. |
| B-11453 | Minor | The `aghfp` library no longer rejects unrecognised AT commands by responding with `ERROR`. It is now the responsibility of the app to handle unrecognised AT commands. |
| B-11471 | Minor | Due to a bug in the Kalimba assembler zeroing bank 2 registers would always be coded as a type A instruction. There is a type C instruction which could be used and would allow more flexible parallel memory accesses.<br>This bug has been resolved and the Kalimba library code has been updated to reflect this. |
| B-11501 | Minor | Support for external events in ButtonParse has been added. |
| B-11504 | Minor | `Buttonparse` now works with active low PIOs by using `PSKEY_PIO_WAKEUP_STATE.` |
| B-11531 | Minor | `app/ps/ps_if.h` now includes the value of `PSKEY_PIO_WAKEUP_STATE` for use by `buttonparse`. |
| B-11534 | Minor | The VM application can now send reports on the HID interrupt channel. |
| B-11541 | Minor | Hid Keyboard security has been improved |
| B-11575 | Minor | BlueLab 3.4 includes the same version of the mono headset as the headset update kit made available for BlueLab 3.3. |




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| ID | Severity | Description |
|---|---|---|
| B-11576 | Major | The `connection` library has been updated connection failure due to timeout correctly. |
| B-11577 | Major | CPU usage when handling HID input reports has been reduced. |
| B-11599 | Minor | New `SourceConfigureHidSensor` traps have been added to configure HID sensors. These supersede the use of `SourceConfigure` for this (as used in BlueLab v3.3), adding type safety and additional parameter checking. |
| B-11639 | Major | When using the raw transport, it was possible for a burst of data arriving on the UART to be ignored if it had a particular timing and no further data was ever received. This no longer occurs. |
| B-11656 | Minor | The task registered using `MessageSystemTask` now receives `MESSAGE_USB_SUSPENDED` messages when BlueCore suspends and resumes on the USB bus. These are only sent when BlueCore is self-powered. |
| B-11690 | Cosmetic | Minor changes in coding style have been made to reduce the code footprint of the `hfp`, `aghfp` and `connection` libraries. These have reduced the size of the `mono headset` by over 4% compared to BlueLab v3.3. |
| B-11725 | Minor | `StreamConfigure(STREAM_UART_CONFIG, ...)` now only modifies settings if the user transport is selected. Previously it could be called for any transport, with undefined consequences. |
| B-11790 | Minor | The response and hold functions in the `aghfp` library have been revised to better support real use cases. |
| M-443 | Cosmetic | Double-clicking on a BlueStack primitive in the output tabs no longer causes xIDE to prompt for a non-existent file. |
| M-469 | Major | Stepping over functions in DSP code in xIDE incorrectly stepped into the function. It now behaves correctly. |
| M-478 | Minor | xIDE no longer produces misleading messages when debugging DSP applications in their own workspace. |
| M-493 | Major | If a breakpoint was set at a multiple word DSP instruction, then xIDE would only execute the final word of the instruction when resuming execution after hitting the breakpoint. This issue is now resolved. |
| M-522 | Fatal | Data symbols are now available when debugging DSP applications using xIDE, in both the variable and watch windows. |
| M-730 | Major | xIDE now discards content from the debugger output windows to keep them below 1000 lines and avoid excessive memory consumption when running for extended periods. |
| M-758 | Minor | xIDE now remembers window positions on a per-project basis; previously if two projects had the same kind of window open, the windows would reopen in the same location. |
| M-759 | Major | **Run** in xIDE previously ran the active project, along with the remaining projects if action on run is set to **Start all processors**. This behaviour was undesirable since the DSP application should be launched by the VM application. This is fixed - running now always selects the VM project if one is present. |
| M-766 | Minor | Multiple projects in a workspace can include the same source file. If a breakpoint is set in the source file xIDE will locate it in the current project if it includes the file. Otherwise it sets the breakpoint in the first project which does include the file. |
| M-773 | Major | Running from breakpoints now works as expected when interrupts are enabled, rather than merely executing an interrupt. |
| M-790 | Major | Kalimba watch window now understands a subscript format. For example: `VarName[Offset]` displays the word of memory at the address of `VarName+Offset`. |
| M-814 | Minor | xIDE now correctly preserves the location of undocked windows between sessions. |
| M-828 | Minor | Kalimba breakpoints sometimes did not work when the vm was restarted by the debugger. This issue has been resolved. |




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| ID | Severity | Description |
|---|---|---|
| M-854 | Minor | Under some circumstances, breakpoints set on lines without any code would be moved to sensible lines and the following message generated in the debug window: "`Failed to install breakpoint at address [incorrect address], is this really RAM?`". This issue has been resolved. |
| M-862 | Minor | xIDE now notices that the dsp has stopped when it hits a data breakpoint. |
| M-863 | Minor | The Kalimba DM breakpoint dialog no longer rejects symbols containing underscores. |
| M-866 | Minor | Writing to registers no longer causes the kalimba to jump to the interrupt service routine. |
| M-867 | Minor | The kalimba symbol table on occassion became corrupt after the second time the debugger was started, causing breakpoints to behave erratically. This issue is now resolved. |
| M-868 | Minor | Running from a dsp break instruction no longer crashes the dsp application. |

**Table Appendix E.1: Issues Resolved in BlueLab v3.4**




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# Terms and Definitions

| | |
|---|---|
| ADC | Analogue to Digital Converter (the analogue inputs on BlueCore) |
| AG | Audio Gateway |
| AT | Attention (modem command prefix) |
| API | Application Programming Interface |
| AVRCP | Audio/Video Remote Control Profile |
| BCCMD | BlueCore Command |
| BCSP | BlueCore Serial Protocol |
| BlueCore™ | Group term for CSR's range of Bluetooth wireless technology chips |
| BlueLab™ | CSR's development toolset for building applications to run in the firmware's VM |
| Bluetooth® | Set of technologies providing audio and data transfer over short-range radio connections |
| BlueStack™ | Mezoe's implementation of a Bluetooth protocol stack (up to RFCOMM level) |
| BlueSuite™ | Family of software utilities for Bluetooth evaluation and development (supplied with CSR development systems Casira, MicroSira, CompactSira). |
| Casira™ | CSR's main Bluetooth evaluation hardware |
| CODEC | COder DECoder |
| CPU | Central Processing Unit |
| CSR | Cambridge Silicon Radio |
| DM | Device Manager |
| DTMF | Dual Tone Multi-frequency |
| DSP | Digital Signal Processor |
| EAG | Embedded Audio Gateway |
| FTPC | File Transport Profile Client |
| FTPS | File Transport Profile Server |
| GAVDP | Generic Audio/Video Distribution Profile |
| GCC | GNU Compiler Collection |
| GOEP | Generic Object Exchange Profile |
| H4 | UART-based HCI transport, described in section of H4of v1.0b of Bluetooth Specification |
| HCI | Host Controller Interface |
| HFP | Handsfree Profile |
| HID | Human Interface Device |
| OBEX | Object EXchange Protocol |
| OPPC | Object Push Protocol Client |
| OPPS | Object Push Protocol Server |
| PABP | Phonebook Access Profile |
| Persistent Store | Storage of BlueCore's configuration values in non-volatile memory |
| PIO | Parallel Input Output; the parallel port on BlueCore |
| RFCOMM | Serial cable emulation protocol (element of Bluetooth) |
| SBC | Sub-Band Coding |
| SCO | Synchronous Connection Oriented link |
| SDP | Service Discovery Protocol |
| SLC | Subscriber Loop Carrier |
| SIG | Special Interest Group (Bluetooth SIG controls the Bluetooth specifications) |
| SPI | Serial Peripheral Interface |




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| | |
|---|---|
| SPP | Serial Port Profile |
| TCP | Transmission Control Protocol |
| UART | Universal Asynchronous Receiver Transmitter |
| UDP | User Datagram Protocol |
| USB | Universal Serial Bus |
| VM | Virtual Machine; environment in the BlueCore firmware for running application-specific code produced with BlueLab |
| xIDE | BlueLab's Integrated Development Environment |




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## Document History

| Revision | Date | Reason for Change |
|---|---|---|
| a | 31JAN 06 | Original publication of this document. (CSR reference: blab-srn-005Pa) |



# BlueLab

# BlueLab v3.4 Software Release Note

## blab-srn-005Pa

## January 2006

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